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DETERMINING GOVERNMENT DISBURSEMENTS FROM NORMALIZED SPENDING P--ETC(U)

MAY 79 W J WEIDA, S D CLARK, J E ROWLAND

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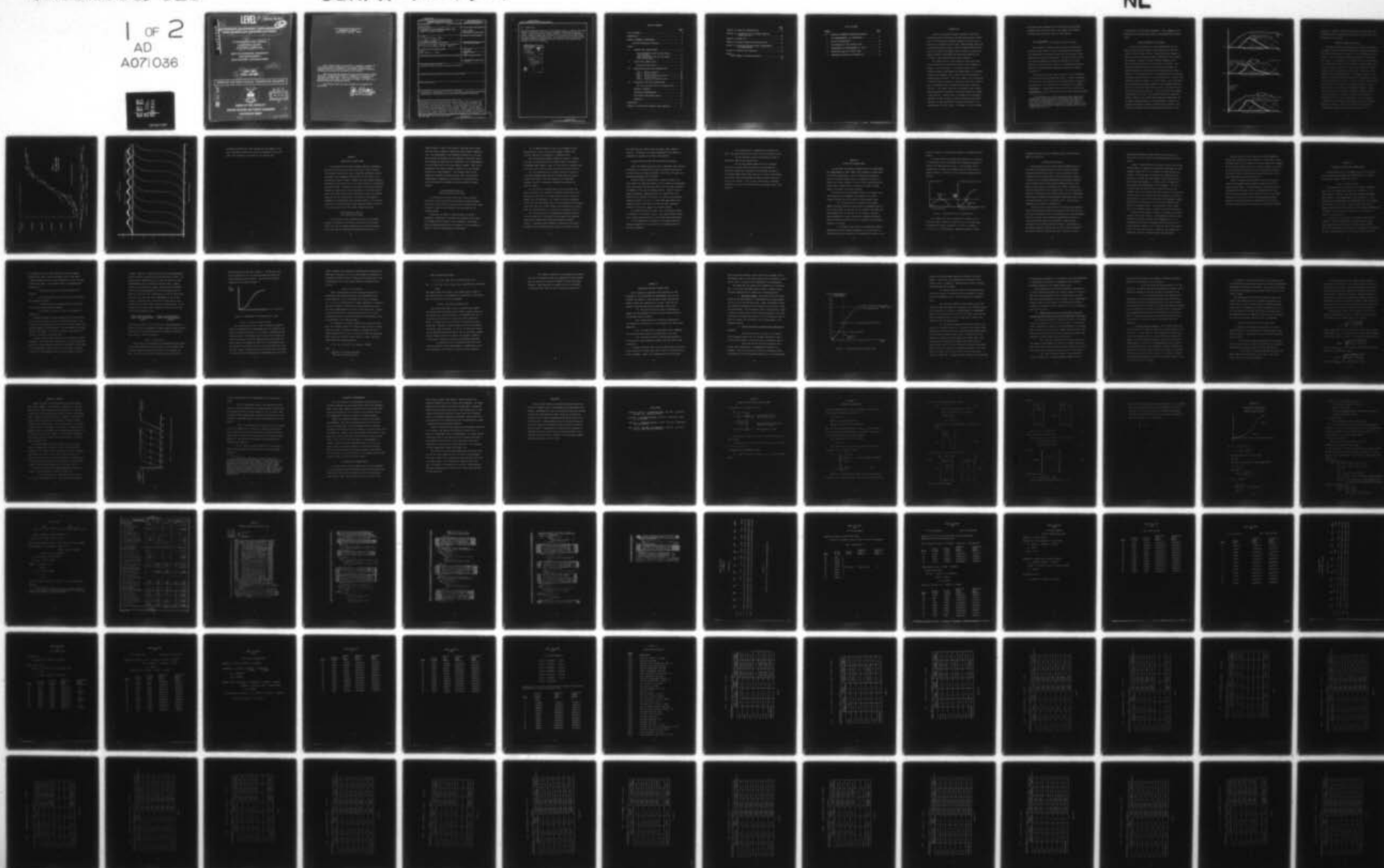

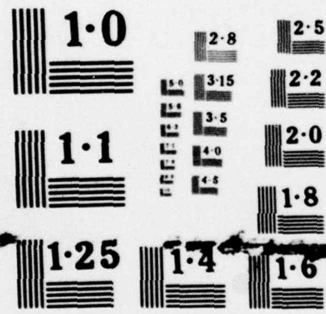

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DETERMINING GOVERNMENT DISBURSEMENTS FROM NORMALIZED SPENDING PATTERNS.

(10)
LT COLONEL WILLIAM J. WEIDA,
2LT STEVEN D. CLARK
2LT JAMES E. ROWLAND

DEPT OF ECONOMICS, GEOGRAPHY
AND MANAGEMENT
USAF ACADEMY, COLORADO 80840

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Editorial Review by Major Ahern
Department of English
USAF Academy, Colorado 80840

This research report is presented as a competent treatment of the subject, worthy of publication. The United States Air Force Academy vouches for the quality of the research, without necessarily endorsing the opinions and conclusions of the authors.

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This research report has been reviewed and is approved for publication.

John P. Wittry

JOHN P. WITTRY, Colonel, USAF
Vice Dean of the Faculty

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These models are the culmination of an attempt to model the disbursement and reimbursement process in the Air Force. Data from every major treasury code category were gathered and investigated. It was determined that total yearly disbursements and reimbursements in each category possessed so many random effects that accurate modelling was not possible. However, when the data was separated into fiscal year monies in each treasury code category, the ability to model the data changed completely. The fiscal year disbursement and reimbursement data showed that, in each case, monies were expended in an S-shaped,

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cumulative expenditure pattern over the spendout period. Forecasts from these separate fiscal year curves were then combined to establish the forecast outlays in each treasury code category by month. To fit the S-shaped fiscal curves, a method of splitting the curve at its inflection point and fitting both halves separately was developed. The end result was the construction of successful models for forecasting monthly outlays in every treasury code category of Air Force spending.

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INTRODUCTION

Economic forecasting is normally dependent on past data. The methods which are selected to analyze these data are a reflection of the researcher's estimates concerning the "best" way to deal with the historical data at hand. These estimates arise from a decision which must be made: should the analyst deal with the data as they appear (the normal course of events), or should the analyst attempt to look beyond the observed data and base his forecasts on other underlying structural conditions.

The United States Air Force (USAF) has always been faced with the problem of forecasting the monthly outlays required to finance all its operations. In the USAF, outlays are the difference between disbursements and reimbursements in 31 general treasury code categories such as 3010F--Aircraft Procurement or 3500F--Military Personnel. The correct amount of the outlays must be known because the treasury is required to have funds on hand to pay, on a monthly basis, the debts which have been incurred by the DOD. If the proper funds are not available at the treasury, these monies must be borrowed at the current market rate to make up any deficits. Although this is a problem for all government agencies, the USAF, through its massive research and purchasing contracts, is more susceptible to making bad estimates of the monthly amount of these outlays. The amount of interest charged

for treasury bills (assume 7-1/2 on 90 day bills) clearly makes mistakes in this area very costly. For example, one shortfall of \$100 million for 90 days would cost the treasury

$$\frac{.075 \times 100,000,000}{4} = \$1,875,000 \text{ in interest expenses.}$$

Past analyses of military outlay data have concentrated on the total outlay figures in each of the treasury code categories. For reasons which will become apparent later in this paper, these analyses have been quite unsuccessful. The data in every treasury code category demonstrate seasonality patterns, but the large variance in the data creates forecasts of unacceptable reliability when any of the conventional trended data regression techniques are applied.[1]

The problem which this paper will address is the development of a new method for forecasting USAF outlays. Outlays are defined to be the total cash outflow in any given month which is required to pay USAF debts. This cash outflow is a function of two elements: disbursements, or monies which flow out of Air Force accounts, and reimbursements, or monies which flow into Air Force accounts (because

[1]Past analyses have utilized Generalized Least Squares with autoregressive schemes, Polynomial Distributed Lags, Almon Lags, Cochran-Orcutt based regression, and Box-Jenkins techniques. In every case, the variability of the data (arising from excessive "white noise") has prohibited sufficiently accurate forecasts. Navy Expenditures Forecast Project, Phase II, Development Items, Synergy Company, March 15, 1973.

of interservice or contractual agreements). Thus, outlays are the difference, in any given month, between disbursements and reimbursements.

MONTHLY INCREMENTAL EXPENDITURES

The initial investigation of this problem showed that the monthly outlays in each treasury code category are actually composed of several strings of data. These strings occur because, at the start of every fiscal year, money is allocated to each treasury code category. However, in almost all major categories, this money is actually spent over the next three to five years. Thus, the observed monthly outlays in any treasury code category are actually composed of several fiscal year subgroups, each of which exhibits its own spending pattern. The possible effects of different overlapping spending patterns on the observed data in a treasury code category are shown in Figures 1, 2, and 3, page 7. Note that unless the increasing and decreasing segments of the incremental distributions for each are non-linear (Figures 2 and 3), no peaks will occur in the observable data (Figure 1). Note also that as these example distributions come closer to the expected shape of an expenditure pattern (Figure 3) the observed data becomes more complicated, and the peaks, although present, are less pronounced. Normally, the observed data pattern in Figure 3 would be said to possess a high degree of seasonality, and forecasts would be made based on this

Fig. 1

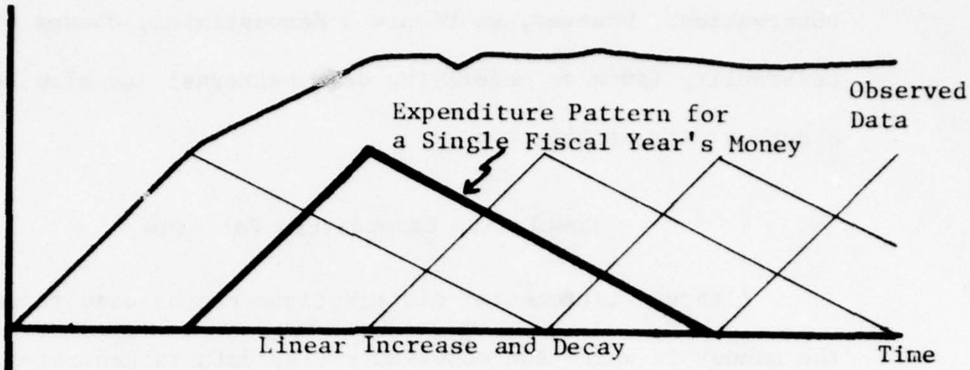


Fig. 2

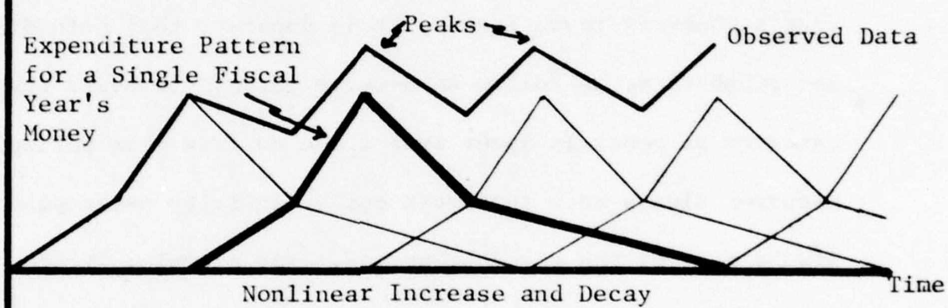
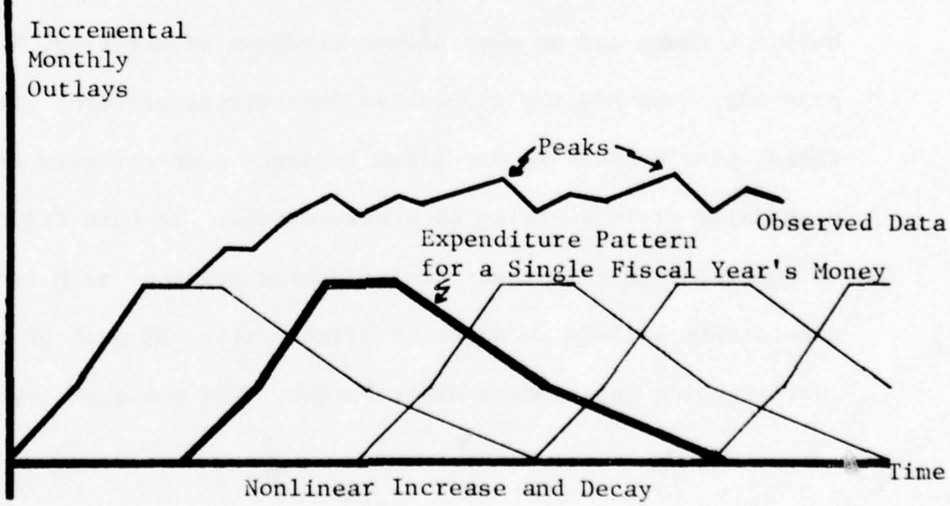


Fig. 3



observation. However, as Figure 3 demonstrates, causes other than seasonality (such as underlying data patterns) may also account for observed data of this type.

Cumulative Expenditure Patterns

Although incremental distributions can be used to demonstrate the manner in which the observed outlay data is generated, cumulative expenditure distributions are easier to use for modelling and forecasting. When the cumulative expenditure pattern for each fiscal year's money is investigated, it is apparent that both disbursements and reimbursements follow an S-curve pattern in every treasury code category as money is spent over a one to five year period. These S-curves always show that most outlay activity takes place in the middle part of the spendout period. For example, Figure 4, page 9, shows the cumulative pattern associated with reimbursements in the aircraft procurement area (3010). This is a typical S-curve pattern which reflects a slow start to the program followed by a rapid building phase and an even slower winddown of activity. Figure 5, page 10, shows how the cumulative expenditure patterns for each fiscal year's money in any given treasury code category will eventually yield a string of observed data. In this figure, it is important to note that the inflection point of each cumulative expenditure pattern is directly aligned with the peak of the corresponding incremental distribution. The peaks of the

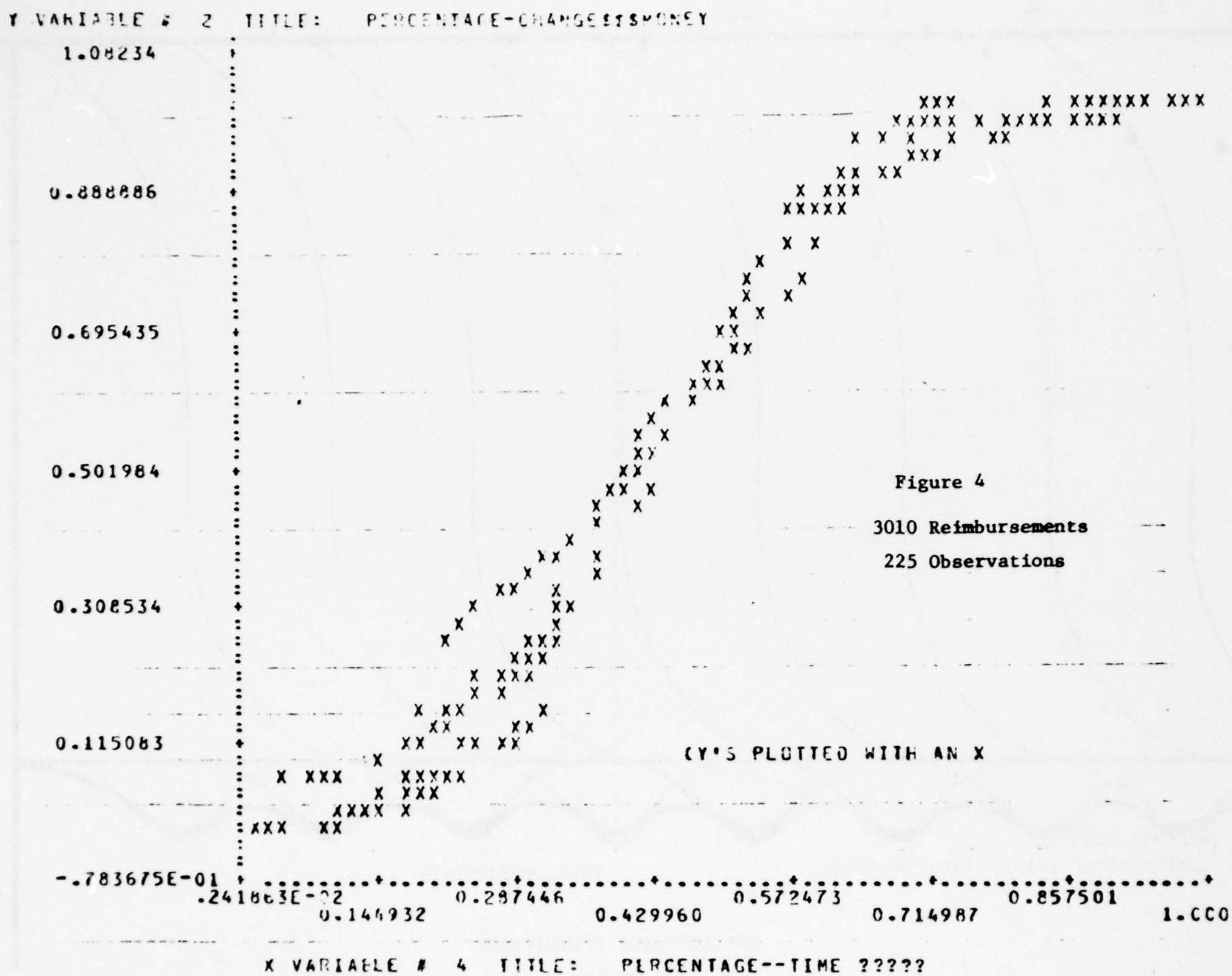


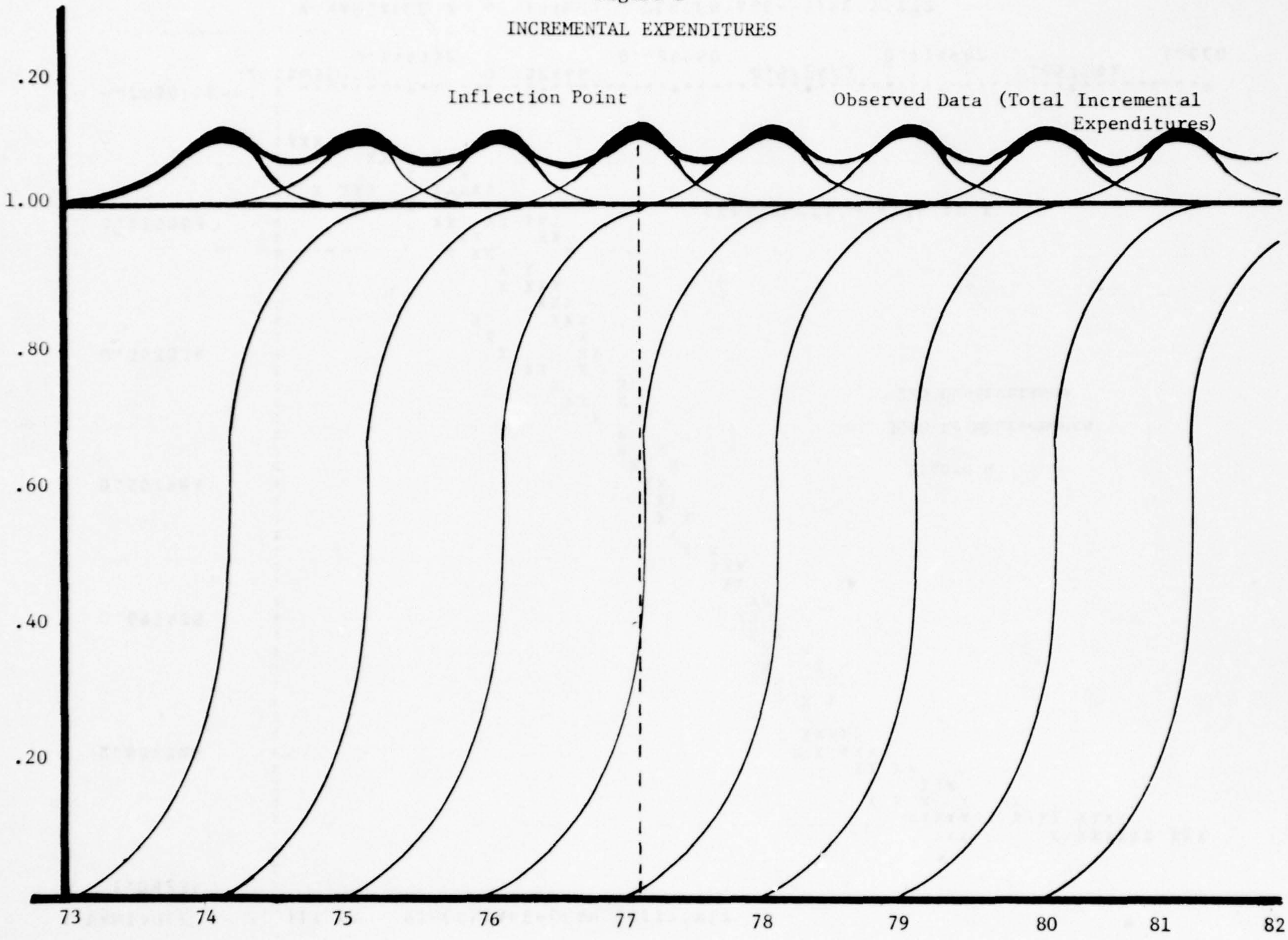
Figure 4

3010 Reimbursements

225 Observations

Figure 5

INCREMENTAL EXPENDITURES



incremental distributions, when combined with the segments of the other incremental distributions which fall immediately below these peaks, then correspond to the peaks in the observed data.

CHAPTER I

DERIVING THE S-SHAPED CURVE

The recognition that regular S-shaped cumulative expenditure patterns do exist for each fiscal year's money in every treasury code category, and that this type of cumulative expenditure pattern can generate the incremental curves which, in turn, result in the observed data shown in Figure 5 suggests that the S-shaped cumulative expenditures curves might serve as the proper vehicle for forecasting Air Force outlays. In addition, since these curves possess detailed information concerning the actual expenditure of each fiscal year's money, they should provide better forecasting accuracy than methods which use only the observed data. This leads to two suggested paradigms for accomplishing fiscal spending research in the military outlay area. The choice between these paradigms depends on whether or not fiscal year data in each outlay category are known.

Actual Expenditure Data for Each Fiscal Year are Known

If the specific yearly expenditure data for every spending category are available, the S-curves can be directly calculated. This is the case for defense expenditures and it should generally be the case with all organizations having historical data. As

shown in Figure 4, page 9, the format for plotting these S-curves should be percent cumulative expenditure versus percent cumulative time. For disbursements, total obligation authority (or, for past data on which the spendout has been completed, total amount spent) will determine the 100% level for expenditures. For reimbursements, the total figure will be the actual amount received. (This can be calculated by the method outlined in Chapter III if the spendout period has not been completed.) Total spendout time for each program will determine the 100% level for time. This method of formatting will compensate for the effects of inflation or any other factors which are dependent on the actual dollar figures involved.

Actual Expenditure Data for Each Fiscal Year are Not Known

If specific data for each fiscal year are not available, and only the total data stream for some general spending category can be used (this would be a case where only the observed data shown in Figure 5, page 10, was available), one may proceed in the following manner.

Assume that the amount of money available for defense spending is constrained to the extent that purchases must be made in accordance with the amount of money available. Also assume that the planning periods which are utilized for this spending are uniform. Then the following points should apply:

(A) As shown in Figure 4, page 9, the spending for each planning period (fiscal year) should resemble a growth curve (S-curve) when data is displayed in a cumulative form.

(B) For any given constant pattern of S-curves, a vertical line can not intersect more than a single S-curve in its period of maximum growth (Figure 5, page 10). This period of maximum growth is the area of the S-curve located closest to the inflection point.

(C) Any intersection of a vertical line and an S-curve at a period of maximum growth will hit all other curves at periods of much lower growth. This characteristic will invariably generate a series of incremental expenditure distributions as shown in Figure 5.

(D) The points of maximum growth (inflection points) and hence, the peaks of the individual incremental distributions, will only occur at intervals of the same length as those on which the growth curves are generated. [If uniform S-curves are generated at the start of each planning period, the time between the inflection points must match the interval between curve generations, no matter where the inflection points are located in each specific S-curve.]

(E) Then the periods of maximum growth (inflection points) of the S-curves will be coincident with the peaks in the observed data, and the observed data stream would appear as shown in Figure 5. Seasonality would normally be suspected as the cause of the peaks in this observed data, but points (A) through (D) above

have shown that this pattern will also result from a family of S-curves. In addition, for defense expenditures, the element of seasonality is probably a very minor consideration.

Constructing Curves When Fiscal Year Data are Unknown

Since the S-shaped curves play such an important role in outlay forecasting, it is desirable to be able to construct these curves even when fiscal year data are missing. When this is the case, the following methodology may be employed.

Assume a string of observed data, as shown in Figure 5, in which neither the underlying pattern of the S-curves nor the specific fiscal year outlays are known (but which, one had reason to believe, is composed of this type of spending pattern). Analyze the data using an appropriate lagging procedure for trended data. The results of this analysis will specify the location of and interval between the peaks in the data. If these peaks are found by this lagging procedure, the inflection points and their associated S-curves, if they exist, must be in a regular pattern.

The distance between the peaks is the time distance between the formation of individual S-curves. This distance should correspond to known planning periods for the system being investigated.

If all expenditures are handled in a percentage format (as previously suggested in this chapter), the following items will have been determined.

(1) the upper level of expenditure is defined to be 100%. The actual vaule must be filled in later from other sources.

(2) the location of the S-curve inflection points is beneath the peaks in the observed data.

(3) the time between generation of the individual S-curves is the time between the peaks in the observed data. These three items plus a knowledge of the planning intervals in the economy being studied, will allow one to infer the time between the start of each S-curve expenditure pattern and the inflection point in that pattern. This, in turn, should lead to reasonable inferences as to the likely ending points and probable shape of the S-curves.

CHAPTER II

FITTING THE S-SHAPED CURVE

At this point, the specific S-shaped curves for disbursements and reimbursements in each treasury code category are either known or have been approximated. Since two well-known equations do exist for fitting S-shaped curves, the temptation is usually to choose one of these equations to fit the curves resulting from the data at hand. However, these techniques will almost certainly result in a failure to get good forecasts.

The failure of the two standard forms of the S-shaped curve (the Logistics and the Gompertz)(See Appendix I) to provide accurate forecasts can be attributed to two principle causes:

(1) The equation for the Gompertz curve assumes symmetry around an inflection point which is the geometric mean of the Y values, while the equation for the Logistics curve makes the same assumption for the true mean of the Y values. Neither of these assumptions is usually justified in real-world situations where the inflection point may occur at virtually any intermediate position on the curve.

(2) Because of the order of the polynomials needed to express these curves, slight perturbations of the data early in the growth process can quickly force the equation for either of the

curves to forecast an unrealistically high or low figure for total growth.

The major problem in handling any S-shaped curve is thus one of keeping under control the higher-order polynomials necessary to express this complicated curve form. If one realizes that any S-shaped curve is merely the cumulative form of a bell curve, as shown in Figure 6, a solution to this particular problem becomes apparent.

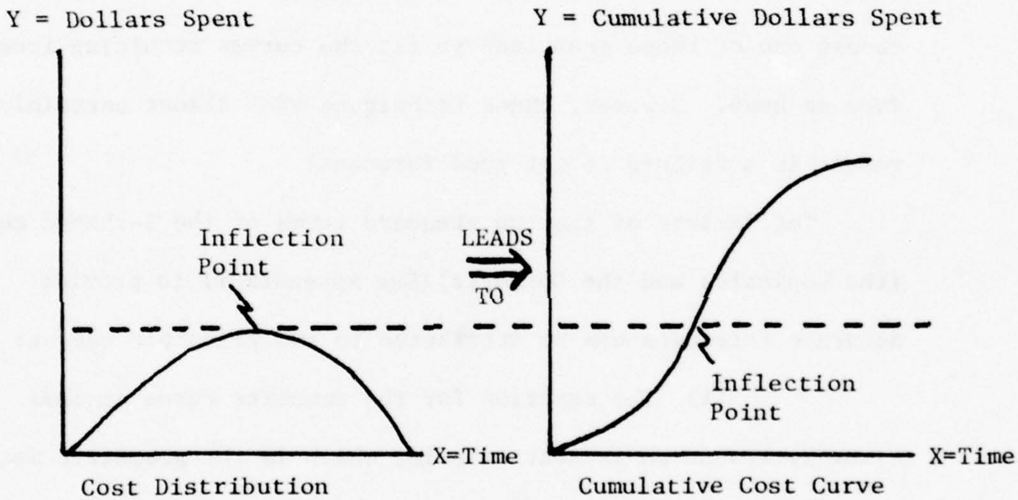


Figure 6. The Derivation of the S-shaped Curve

The S-shaped curve may be separated (or "broken") at the inflection point to yield two simpler curves of a form which may be expressed by either a logrithmic ($y = ax^b$) or a quadratic ($y = a + b_1 x_1 + b_2 x_1^2$) equation. Standard econometric fitting

techniques may then be used to determine which of these two curve forms is the best fit.

Treating Autocorrelation

Selecting the best curve form is greatly complicated by the fact that the time dependent nature of these curves, and indeed the entire outlay process, tends to cause a great deal of autocorrelation in the resulting data. This autocorrelation, which is a violation of the necessary assumption that regression residuals are not related, must be dealt with and eliminated from the data before a valid selection of equations can be made to express the lower and upper halves of the S-shaped curve. For this particular research, autocorrelation was removed through the use of Generalized Least Squares following an autoregressive transformation which used a two-step procedure for the estimation of Rho. This process is explained in its entirety in Appendix II.

The method used in this research for treating each additional order of autocorrelation removes one additional data point from the lower end of whichever half of the S-shaped curve is being considered. This occurs because each succeeding transformation steps back in time one data point further in an attempt to remove any past influences on the current regression residual. This process has an inherent benefit in that it tends to weight recent observations more heavily than past observations, and it results in a rather

sophisticated smoothing technique which the user may vary to assure that the fitted curves will converge rapidly on the proper values.

Tables I through LXIV show the results of this curve fitting technique when it is applied to actual USAF disbursement and reimbursement figures for FY 73 to 78 monies in every treasury code category. The tables give the general curve equation which is derived for the upper and lower segment of the S-shaped curve in each treasury code category. A separate table is included for disbursements and reimbursements in each category. The rows of the tables give the statistics which result from fitting the S-shaped curve to each fiscal year's data as well as the statistics from the general curve equation which is presented on that table. In some cases, the last two or more years of an expenditure pattern show virtually no change since all of the monies had been spent early in the spendout period. In these cases, a third, linear part of the expenditure curve is broken out and fitted separately.

When each curve segment is fitted, the segments are rejoined to derive the complete S-curve. The mathematics involved in this procedure are covered in Chapter III and Appendix III. It is interesting to note that the variance involved in using two (or three) equations instead of one is merely the sum of the variances for the two (or three) equations. Therefore, the standard error involved in using this technique remains relatively small.

When the curves for each fiscal year in every expenditure category are developed, the same technique of calculating the upper and lower halves of the S-shaped curve and then mating these segments at the inflection point can be used to derive a general curve based on the data from all fiscal years in each treasury code category. This general curve then serves as the forecasting vehicle for new fiscal year monies for which no data exist.

Tables I through LXIV also show the results of fitting the general curve segments using a quadratic equation for both the lower and upper halves. A certain degree of heteroscedasticity is introduced into these data sets by a normalization of the data which forces the S-shaped curve to begin at the 0% time and expenditures point and end at the 100% time and expenditures point. Because of the obvious statistical significance of the results, the heteroscedasticity was not deemed to be a significant problem.

CHAPTER III

DEVELOPING AND USING THE S-SHAPED CURVE

A general method for the development and use of the S-shaped curve to describe disbursements and reimbursements in a specific treasury code category follows these steps:

Step 1: Collect the Data

The end objective of this study is to calculate the monthly outlays in each treasury code category (14 in Exhibit I). The outlay figure is composed of the difference between disbursements (14A in Exhibit I) and reimbursements (14B in Exhibit I). Forecasting both the disbursements and reimbursements and then combining these figures to get the outlay figure for each month provides greater accuracy than could be achieved with alternative methodologies. In addition, this method has the advantage of corresponding to normal Air Force procedures.

The data used in this project are recorded on DD Form 1176 (Exhibit I) and then transferred to computer tape for storage. Extracting the data from this tape presented several problems. First, the DD Form 1176 records data in a format which is cumulative by year. The methodology used in this study requires data which

are cumulative over the entire spendout period, and normally several fiscal years' data are included in such a time period. A computer program had to be written (Exhibit II) to get this data in the proper format. This program creates the cumulative data format, and it:

(1) Extracts data from the tape by treasury code category.

(2) Extracts specific years of data from each treasury code category if desired.

(3) Calculates the percentage figures and places data in the proper format using these figures.

(4) Transmits this data to cards, a line printer, or another file.

Two major problems arise when working with DD Form 1176 data. First, the data included in FY 76T are basically unuseable. This results from the extremely short duration of this fiscal period and the small amounts of money involved. For these reasons, and because another single quarter fiscal year is unlikely, these data are not analyzed or included in the outlay model.

Second, a problem arises concerning the total amount of reimbursements. This figure must be known since it is used in the same manner as the Total Obligation Authority to establish the 100% level for reimbursements in every account. The 100% figure is obvious in the case of disbursements since the Total Obligation Authority

is known. However, no similar indication of total reimbursements exists, and hence, some proxy for this figure must be found. For accounts where complete data do not exist, the figure for total reimbursements can be extrapolated from prior data. Assume a treasury code category (for example, 3010--Aircraft Procurement) where the total reimbursements for the FY 1978 account are not known, but where the total reimbursements for the FY 1975 account are known. The proxy for total reimbursements in the FY 1978 account is calculated from a combination of past data for both accounts and the latest monthly data for the 1978 account. If the 9th month's data are the latest available, and if all of the data for FY 1975 are available, then

$$\frac{\text{FY1975, 9th Month (Known)}}{\underset{\text{(Known)}}{\text{FY1975, Total Reimbursements}}} = \frac{\text{FY1978, 9th Month (Known)}}{\underset{\text{(Unknown)}}{\text{FY1978, Total Reimbursements}}}$$

This naive calculation of the FY 1978 total could undoubtedly be improved by having a knowledgeable program manager provide subjective inputs based on recent information about the manner in which the 3010 account is currently operating.

Step 2: Plot the Curve

When the data for disbursements and reimbursements are placed in the proper cumulative percentage format, and the spendout times have been similarly calculated, the effect is to normalize the data. Any set of data can now be compared with any other set of

data when plotted on the axis of Figure 7. At this point, the entire S-shaped curve for the outlay category and fiscal year being investigated can be plotted. The result will generally resemble the curve shown in Figure 7.

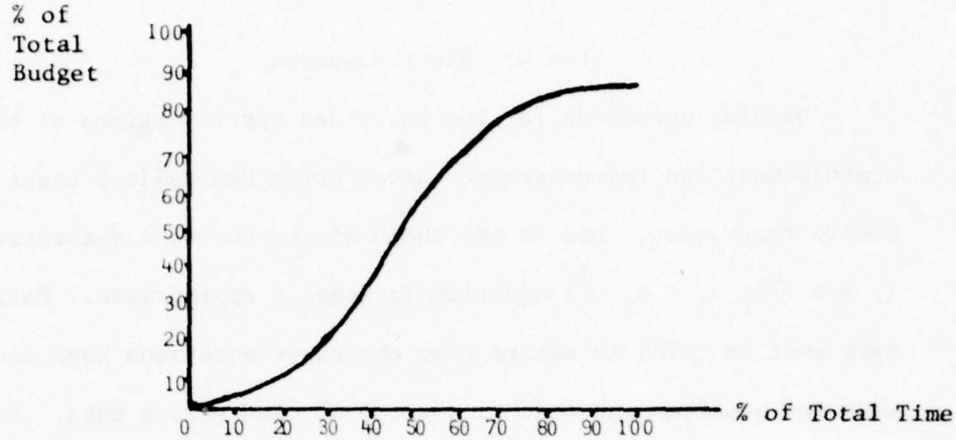


Figure 7. Disbursements or Reimbursements vs. Time

Step 3: Locate the Inflection Point

After plotting the S-curve, locate the largest incremental change in disbursements or reimbursements which is followed by two periods of decreasing change. This increment is designated as the inflection point. The S-shaped curve is broken at this point and the inflection point becomes the <u>last</u> data point on the first (or lower) curve and the <u>first</u> data point on the second (upper) curve. This common point allows the curves to be spliced again after curve fitting. Tables I through LXIV show the location of all the inflection points for the disbursement and reimbursement data. Note that

within a treasury code category the inflection point occurs at the same general time point, but with a great amount of variability in the percent of money involved. Because all the points occur in the linear portion of the curve, exact location of the point is not critical.

Step 4: Fit the Curves

Develop equations for the lower and upper portions of the disbursement and reimbursement curves using Generalized Least Square regression. Due to the shape of the curve, a quadratic ($y = a + b_1 x_1 + b_3 x_1^2$) equation is usually appropriate. Particular care must be taken to assure that the curve equations have dealt with the problems inherent in the use of time series data. Failure to correct the problem of autocorrelation will result in curve equations which are of little value and which will adversely affect the performance of the completed model.

If a complete, or virtually complete, set of data are available, an alternative method of fitting the entire curve in a single step can be used. This can be accomplished through the use of a dummy variable which is 0 prior to the time at which the inflection point occurs and 1 after the time at which it occurs. This procedure yields the following equation:

$$y = a_1 + b_1 x_1 + b_2 x_1^2 + a_2 D + b_3 (DS_1) + by(DS_1^2)$$

where

$$D = \begin{cases} 0 \text{ prior to the inflection point} \\ 1 \text{ after the inflection point.} \end{cases}$$

Thus, this equation becomes

$$y = a_1 + b_1 x_1 + bx_1^2 \text{ prior to the inflection point}$$

and $$y = (A_1 + a_2) + (b_1 + b_3)x_1 + (B_2 + b_4)x_1^2 \text{ after the inflection point.}$$

This method allows both halves of the S-shaped curve to meet at the inflection point in approximately the same manner as they would meet if both halves were fitted separately.

Step 5: Calculate the General Curve

After each fiscal years' data in a treasury code category are analyzed using the methods just described, a general curve for each category can also be calculated. To accomplish this, all of the data for the lower part of each fiscal year's program are pooled. A general lower curve equation is calculated from this pooled data. Similarly, a general upper curve is also calculated from pooled, upper curve data. Or, all of the data may be pooled and the dummy variable approach may be used to calculate a complete general S-shaped curve for a treasury code category. However it is calculated, this general curve has the following advantages:

It contains all of the information which exists concerning the manner in which disbursements or reimbursements occur. This information is not biased by a specific years' experience.

The variance statistics for the general curve express the level of uncertainty which has accompanied all past programs. This, in turn, sets a realistic boundary for future experience. Because of these advantages, the general curve is an excellent forecasting vehicle whose use will be explored in Chapter IV.

CHAPTER IV

FORECASTING USING THE S-SHAPED CURVE

Once the specific and general curve equations have been developed for the disbursement and reimbursement data for each treasury code category, a decision must be made concerning the manner in which these equations will be used. There are four possible conditions which may be encountered at this point:

(I) The data for which the curve is developed are complete and the equations for both the lower and upper parts of the S-shaped curves are known.

(II) Enough data exist to allow the calculation of the equation for the lower part of the S-shaped curve, but not the upper part.

(III) The lower part of the S-shaped curve is complete, but only partial data exist for the upper part of the curve.

(IV) No actual data exist concerning the spendout of a fiscal year's monies because the fiscal year will start at some future date.

As Figure 5, page 10, shows, the total amount spent in any given month is composed of amounts spent from a number of different fiscal year's programs. Indeed, if the spendout period is three years,

points from three different curves will have to be summed, and if the spendout lasts for five years, points from five different curves must be used to calculate total disbursements or reimbursements.

This means that any forecast will probably have to deal with most or all of the conditions listed in point I through IV above, and these conditions can be handled in the following manner:

I. All data are known. This implies that the spendout period for the disbursements or reimbursements has already elapsed or will do so in the very near future. Hence, the amounts of money can be directly calculated from the equations for the curve if they are already known. Since the general curve is derived from a number of specific programs, many of which have been completed, this curve only requires the appropriate entries for the percentage of time in order to calculate the percentage of total reimbursement or disbursement involved.

II. Partial data exist to calculate the lower part of the curve.

(A) First derive the two halves of the equation for the general S-shaped curve in the manner described in Step 5 of the previous chapter. This gives curve 1 of Figure 8, page 31.

(B) Assume now that the first data points concerning actual disbursement or reimbursement information are available. These data points are converted to percentage figures by dividing by the Total Obligation Authority or Total Reimbursement

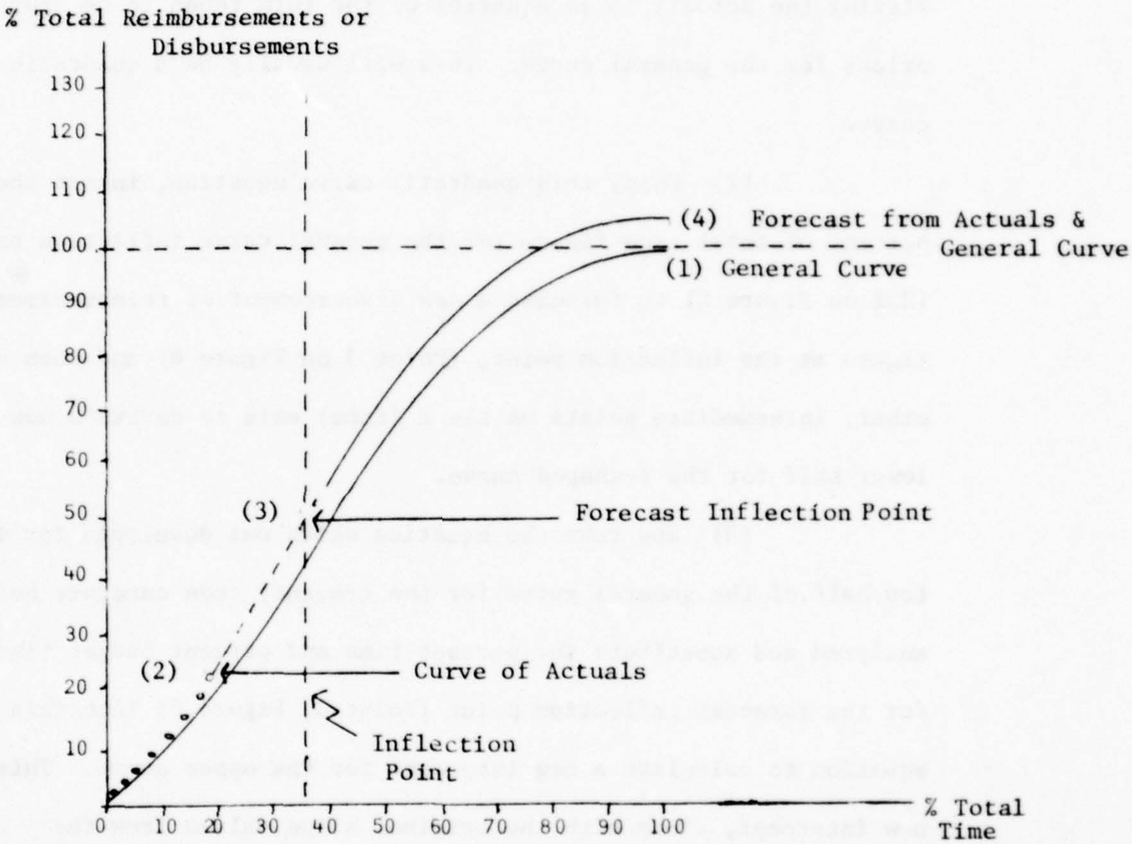


Figure 8. Forecasting From the S-Shaped Curve

Figures, and the percentage figures are plotted on the axis of Figure 8. This leads to the beginning of an "actuals" curve, shown as curve 2 of Figure 8. These actuals are used to forecast new monthly outlays as follows:

(1) Derive a new lower half of the S-shaped curve by fitting the actuals to an equation of the form found to be appropriate for the general curve. This will usually be a quadratic curve.

(2) Using this quadratic curve equation, insert the percent of total time figure for the general curve inflection point (35% on Figure 8) to forecast a new disbursement or reimbursement figure at the inflection point, (Point 3 on Figure 8) and then use other, intermediate points on the X (time) axis to derive a new lower half for the S-shaped curve.

(3) Now take the equation which was developed for the top half of the general curve for the treasury code category being analyzed and substitute the percent time and percent budget figures for the forecast inflection point (Point 3, Figure 8) into this equation to calculate a new intercept for the upper curve. This new intercept, along with the original slope values from the general curve, has the effect of "splicing" the equation developed from the first half actuals to the general equation for the second half of the curve, all of which yields the new S-shaped curve (Curve 4 of Figure 8). In addition, this procedure has the advantage

of allowing the development of a forecast for the total disbursement or reimbursement level which is constrained by the historical information inherent in the original budget curve.

Since disbursements are limited by Congress to the amount in the Total Obligation Authority, the situation depicted in Figure 8 where the final disbursement level is increased beyond the 100% (TOA) point would hopefully be rare. However, in the reimbursement category, where the total figure is never known with certainty, increases or decreases from the estimated level of total reimbursements are very likely.

III. <u>Complete data exist for the lower part of the curve and some data may or may not exist for the upper part of the curve.</u>

With the general method for handling data early in the spend-out period established, the next area of interest is the forecast which is made when the string of actual disbursements or reimbursements stretches all the way to the assumed inflection point. When this occurs two courses of action are possible as the actual data approaches and then crosses the inflection point:

(A) Until the inflection point has been reached, the best method of forecasting is to continue to develop a new lower half of the curve from the actuals, and then to map this curve into the general curve as was done in section II.B.3 of this chapter.

(B) After the actuals appear to have crossed the inflection point (i.e., a large incremental change in a given

period has been followed by two periods of decreasing incremental changes) one can proceed in one of two ways:

(1) If the actual data points continue to fit the top half of the general curve within an appropriate tolerance level, continue to forecast by using the top half of the general curve.

(2) If the actual data points are diverging from the general curve, and if enough actual data points exist beyond the inflection point for regression analysis to be used, calculate a new equation for the top half of the curve using whichever equation form was appropriate in deriving the general curve. This presumes that at least five data points have occurred past the inflection point. It should be noted that good accuracy in generating a new curve will not occur until at least 10 data points have been identified.

IV. No actual data is available. This condition exists any time the forecast is required to pass into the first month of a new fiscal year. At this time, only three things will be known about the possible outlays which will result from the new fiscal year's monies: the Total Obligation Authority which governs the level of disbursements, the expected Total Reimbursements, and the length of the spendout period. This information is enough to provide the dimensions into which the general curve can be mapped. The general curve, which is derived from all past data in a specific treasury code category thus becomes the proxy for forecasting outlays in the new fiscal year in this category.

The ability to use the general curve in this manner points up the importance of analyzing the data in the 100% of disbursements/ reimbursements and 100% of time format. Only by using this format for all data can comparisons and forecasts from one fiscal year to another be made.

The Congressional restriction on spending in each of the treasury code categories forces an important constraint on the outlay process. This constraint keeps the differences between fiscal years to a minimum and it allows the general curve to act as a good proxy for the actual data either as the upper part of the forecasting curve (as suggested in parts II and III above), or as the entire curve when a new fiscal year is considered.

The Error Associated With the S-Shaped Curve

For simplicity, no mention has been made of the errors associated with the curve derivation and the forecasting in the previous chapter. A discussion of these errors must essentially cover two cases:

(1) The use of equations developed for the complete lower or upper curves for either the general curve or a specific fiscal year curve (Steps 1 and 4 of the previous chapter).

(2) The use of an equation developed from actual data which forms only the initial part of an upper or lower curve (Steps 2 and 3 of the previous chapter).

In the first case, the error associated with using the equation for the lower part of the curve is simply a function of the variance of that curve. The error associated with the upper curve is then the sum of the upper curve variance and the lower curve variance. Appendix III contains a complete derivation of this result. In this case, establishing confidence intervals to deal with the errors in forecasting is simple. When dealing with the upper part of the curve, the standard deviation is merely the square root of the sum of the upper and lower curve variances.

Calculating the standard error involved in case 2 is as simple as the procedure for case 1. However, in this situation, the equation for the standard error of the forecast

$$S_f = S_{yx}\sqrt{1 + \frac{1}{n} + \frac{(X_0 - \bar{X})^2}{\Sigma(X - \bar{X})^2}}$$

must be substituted for the standard error of the upper or lower curve segment (S_{yx}). This means that the standard error associated with the upper curve in section 2 of the previous chapter would be

$$S_{(upper)} = \sqrt{S^2_{f(lower)} + S^2_{yx(upper)}}$$

where X_0 in $S^2_{f(lower)}$ is the inflection point which was forecast. For Step 3 of the previous chapter

$$S_{(upper)} = \sqrt{S^2_{yx(lower)} + S^2_{f(upper)}}$$

where X_0 in $S^2_{f(upper)}$ is the point being forecast.

CREATING A FORECAST

Exhibit III shows an actual forecast for the 3600 Treasury Code Category (RTD&E). This forecast is constructed to look like and to give the same information as the outlay plan. A forecast is made for each fiscal year's money which is still in the spendout phase. Figure 9, page 38, shows how the different fiscal years are arrayed and why the forecast will consider a different 12-month segment of each S-shaped curve. Thus, each S-shaped curve requires a different type of forecasting. FY 76, which is further into its spendout period, is calculated from the equation generated from its own data since this data is complete. FY 79, which is beginning just as this forecast is made, has no data and hence, is forecast from the general curve.

The Total Obligation Authority (TOA) which sets the 100% point for disbursements is known for each of the fiscal years including FY 79. Because of the need for the TOA figure, forecasts which extend into future fiscal years for which the TOA is not known are very difficult to make with any degree of certainty, and the probable error associated with the estimation of the TOA must be added to the variance discussed in the previous section.

The specific forecasts for RTD&E disbursements are done as follows: (All calculations are shown in Exhibit III)

FY 76: The forecast is made from the linear portion at the end of the spendout period. All money has been expended,

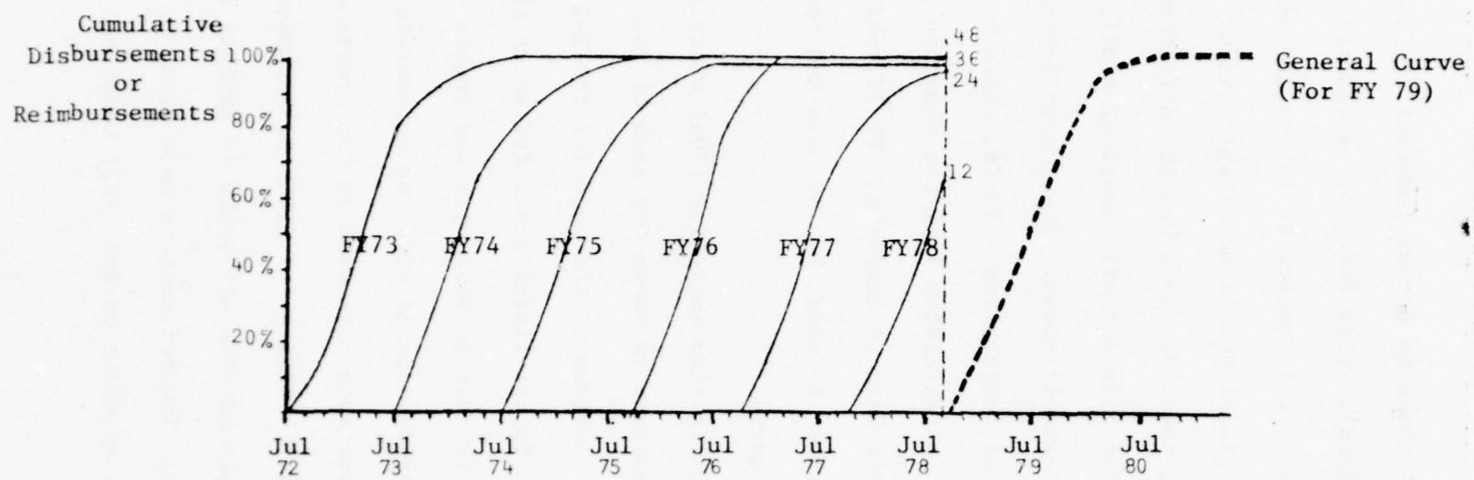


Figure 9. Forecasting Situation for October 1978.

and the forecast calls for no disbursements in the twelve month period.

FY 77: Enough points exist in the upper half of this S-curve to allow the generation of an equation based on actual data. This equation is used to forecast months 25, 26, 27, and 28. Then the general linear equation which expresses the activity in the last 20 months of any RTD&E program is used to calculate the rest of the points.[1]

FY 78: In this forecast, the lower part of the S-shaped curve has a complete set of actual data. However, no data exist for the upper part of the curve and hence, the upper part from the general curve is spliced to the lower curve at the inflection point (Month 12). The forecasts are then made from the general curve for months 13 through 24.

FY 79: There is no data available for this forecast and the lower equation for the general curve is used for months 1 through 12.

---

[1]The 3600 category (RTD&E) has a normal S-shaped curve spendout pattern for the first 28 months. At this time, all money has been spent and the remaining 20 months contain only minor adjustments to the account. For this reason, a normal S-shaped curve is fit to the first 28 months of data and then a linear projection is made from month 29 to month 48. Other treasury code categories where this technique is used can be readily identified in Tables I through LXIV by the inclusion of an additional linear equation after the lower and upper quadratic equations for the S-shaped curve.

FORECASTING REIMBURSEMENTS

After the forecasts for disbursements for each fiscal year are made, forecasts are also constructed for each year's reimbursements. Since these figures are tied directly to the fiscal years which were the subject of the forecasts in the previous section, the reimbursement forecasts are made in an identical manner.

However, one additional problem is present in forecasting reimbursements. The total reimbursement amount for each fiscal year is not known until the entire spendout period is complete. The method for arriving at this total amount is covered on pages 23-24 in Chapter III. However, this method presumes the existence of some data, and it will not work for a new fiscal year in which no data exist. Thus, for FY 79 the total amount of reimbursements is chosen to reflect the mean reimbursement level for the last six years as well as the yearly pattern of increases and decreases. This is not the best method of choosing a number, and an analyst who has access to the actual workings of each spending program could probably produce a far more accurate estimate.

THE SPECIFIC AND GENERAL MODELS

In order to show that the S-shaped curve is truly applicable to all disbursements and reimbursements, and in order to provide the equations for the specific and general curves for each treasury code category, models are presented for every fiscal year since

1973 in every treasury code category. Exhibit IV gives the numerical identifiers for the treasury code categories. The models themselves are the subject of Tables I through LXIV. The general equation for the lower or upper part of the S-shaped curve in each category is given and statistics for each fiscal year's equation as well as the general equation are presented. The specific fiscal year equations are not included since they will generally be subject to updating as new data becomes available.

Tables I through LXIV are labeled with the numerical identifier for a treasury code category followed by the letter A or B. A refers to disbursements and B to reimbursements. The tables labeled (first part) refer to the lower part of the S-shaped curve while those labeled (2nd part) refer to the upper part of the curve. Infrequently, a table will be labeled (3rd part). This indicates a linear segment which follows an S-shaped curve.

The statistics in these tables demonstrate conclusively that not only does the S-shaped curve fit this type of data extremely well, but in addition the standard error associated with these fits is extremely small. The column labeled "Sigma Squared" gives S^2_{yx}, the variance of the equation for the curve. These variances show that one should expect errors of 1% or lower when using most of these equations.

CONCLUSION

There are both intuitive and theoretical justifications for the use of S-shaped curves in disbursement and reimbursement forecasting. Separating this curve at the inflection point and fitting the two halves individually provides a means of increasing the accuracy of the fit while simultaneously providing a better forecasting vehicle. Actual experience with the Air Force budget has shown that forecasts of potentially useful accuracy are possible with this method. Additionally, the method has the advantage of utilizing data in the format which is currently available, and of producing a forecast which is identical to the planning documents currently being used in the Air Force.

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APPENDIX I

LOGISTICS AND GOMPERTZ CURVE EQUATIONS

The equation for the Logistic Curve is

$$\frac{1}{Y_c} = k + ab^x \quad \text{where}$$

$$a = (\Sigma_2 Y - \Sigma_1 Y)\frac{b-1}{(b^n - 1)^2} \quad = \text{the difference between } Y_c \text{ at } X_o \text{ and } Y_c \text{ at } K$$

$$b = \sqrt[n]{\frac{\Sigma_3 Y - \Sigma_2 Y}{\Sigma_2 Y - \Sigma_1 Y}} \quad = \text{the ratio between successive increments of growth.}$$

$$k = \frac{1}{n}\left(\Sigma_1 Y - \frac{b^n - 1}{b-1}\, a\right) \quad = \text{the asymptote or limit}$$

and Σ_1, Σ_2, Σ_3 refer to the first, second and third parts of the Y values.

n is the number of observations in each of the three "parts" or sections of Y values.

The equation for the Gompertz curve is

$Y_c = k_a^{\,bx}$ using the same formulas for k, a and b as shown above.

APPENDIX II

REMOVING AUTOCORRELATION

Given that autocorrelation exists, the observed residual term e_t is actually a combination of two errors

$$e_t = \rho e_{t-1} + \nu_t$$

where ν_t is the true error term

and e_{t-1} is the previous residual term.

Since the true relationship between e_t and e_{t-1}, ρ, is unknown, it must be estimated. Several methods are available for doing this, and this study employs the following approach:

(a) compute all of the n LS residuals

$e_1, \ldots\ldots e_n$

(b) compute the ratio of the mean product of successive residuals to the LS variance estimator

or $$\hat{\rho} = \frac{\frac{1}{n-1} \sum_{\alpha=1}^{n-1} e_\alpha e_{\alpha+1}}{\frac{1}{n-k} \sum_{\alpha=1}^{n} e_\alpha^2}$$ = the estimated relationship

$$\therefore \quad \hat{\rho} = \frac{\sum_{\alpha=1}^{n-1} e_\alpha e_{\alpha+1}}{(n-1)\, S^2} \qquad (1)$$

Once this estimation has been made, $\hat{\rho}$ may be used with the Generalized Least Squares method to remove the autocorrelation from

the data. This method proceeds as follows:

Given: $Y = X\beta + e$ (2)

where e is the matrix of residuals

in which autocorrelation is present.

Thus for any e_t

$$e_t = \rho e_{t-1} + \nu_t$$

substituting $\hat{\rho}$ for ρ, we multiply by a "differencing" matrix

$$D = \begin{bmatrix} \sqrt{1-\hat{\rho}^2} & & & & 0 \\ -\hat{\rho} & 1 & & & \\ & \ddots & \ddots & & \\ & & \ddots & \ddots & \\ 0 & & & -\hat{\rho} & 1 \end{bmatrix} \tag{3}$$

(2) may now be transformed by (3) to yield

$$(DY) = (DX)\beta + (De) \tag{4}$$

where

$$De = \begin{bmatrix} \sqrt{1-\hat{\rho}^2}\, e_1 \\ -\hat{\rho}e_1 + e_2 \\ -\hat{\rho}e_2 + e_3 \\ \vdots \\ -\hat{\rho}e_{n-1} + e_n \end{bmatrix} = \begin{bmatrix} \sqrt{1-\hat{\rho}^2}\, e_1 \\ \nu_2 \\ \nu_3 \\ \vdots \\ \nu_2 \end{bmatrix} \tag{5}$$

the set of true error terms.

Similarly

$$DY = \begin{bmatrix} \sqrt{1-\hat{\rho}^2} \; y_1 \\ -\hat{\rho}y_1 + y_2 \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ -\hat{\rho}y_{n-1} + y_n \end{bmatrix} \quad \text{and } DX = \begin{bmatrix} \sqrt{1-\hat{\rho}^2} \; x_1 \\ -\hat{\rho}x_1 + x_2 \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ -\hat{\rho}x_{n-1} + x_n \end{bmatrix} \tag{6}$$

Recalling that $\beta = (X'X)^{-1}X'Y,$ (7)

the OLS solution of (4) is given by

substituting DY for Y and DX for X in (7) to yield

$$\hat{\beta} = [(DX)'(DX)]^{-1} (DX)'DY$$

$$= [X'(D'D)X]^{-1} X'(D'D)Y \tag{8}$$

From (3),

$$\Omega = D'D = \begin{bmatrix} 1 & -\hat{\rho} & & 0 \\ -\hat{\rho} & 1+\hat{\rho}^2 & -\hat{\rho} & \\ & \ddots & \ddots & \ddots \\ & & & -\hat{\rho} \\ 0 & & -\hat{\rho} & 1 \end{bmatrix} \tag{9}$$

and the GLS solution is

$\hat{\beta} = (X'\Omega X)^{-1} X'\Omega Y$ which,

by (5) eliminates the autocorrelation if $\hat{\rho} \equiv \rho$.

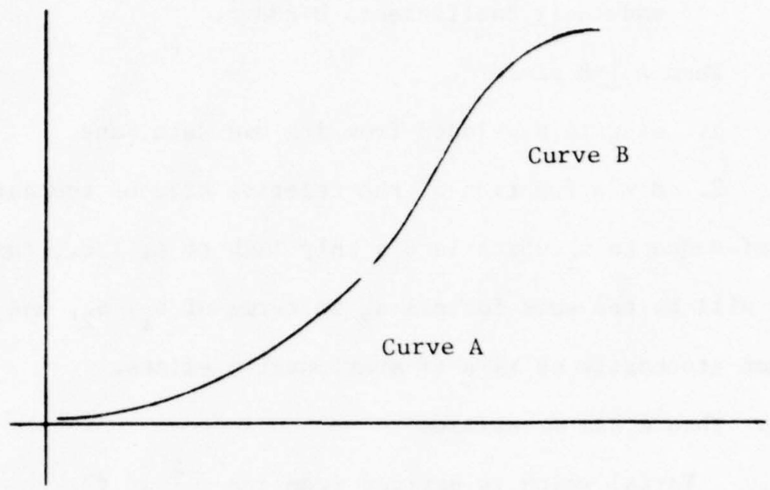
Since $\hat{\rho}$ is an estimate, and not an exact value for ρ, it is unlikely that this process will remove all autocorrelation on the first iteration. For this reason, multiple iterations are generally used with this technique and a new $\hat{\rho}$ is calculated by equation (1) after each iteration. For n iterations

$$\sum_{i=1}^{n} \hat{\rho}_i = \rho.$$

APPENDIX III

CALCULATION OF THE VARIANCE

WHEN TWO CURVES ARE USED



Let $A = \alpha_1 + b_1X_1 + b_2X_1^2 + \mu$

$B = \alpha_2 + b_{11}X_1 - b_{22}X_1^2 + \mu$

1. Then assume that $E(\mu) \neq 0$ for either equation.
2. Now apply an autoregressive transformation where

   $\mu_t = \rho\mu_{t-1} + \varepsilon_t$

   then $E(\varepsilon_t) = 0$

   $$E(\varepsilon_t\varepsilon_s) = \begin{cases} 0, t \neq s \\ \sigma_e^2, t = s \end{cases}$$

   and $\rho < 1$ where

   $$\hat{\rho} = \frac{\sum_{t=2}^{T} \mu_t\mu_{t-1}}{\sum_{t=2}^{T} \mu_{t-1}^2} = \text{the estimate of } \rho$$

3. Now $A = \alpha_1 + b_1X_1 + b_2X_1^2 + \hat{\rho}_1\mu_{t-1} + \varepsilon_t$

$B = \alpha_2 + b_{11}X_1 - b_{22}X_1^2 + \hat{\rho}_2\mu_{t-1} + \varepsilon_t$

and $E(\varepsilon_t) = 0$ so that

A and B are generated based on the values of X_1 and μ_{t-1} and their coefficients b and $\hat{\rho}$.

4. Then $A \perp B$ since

1. each is developed from its own data, and

2. B = a function of the relative size of the data without reference to α_2 which is B's only link to A, i.e., the equation for B will be the same for all α_2 in terms of b_1, b_2, and $\hat{\rho}$. X_1 is non-stochastic as is μ if stationarity exists.

5. Then A has a variance

Var(A) which is derived from the σ_e^2 of #2.

Likewise B has a similar variance Var(B).

6. When arriving at a forecast for some point on curve B, one must add the forecast for the inflection point on curve A (A_I) to the forecast for the desired point on curve B (B_d). This is merely the summation of:[1]

---

[1] $$E(A) = E(\alpha_1 + b_1X_1 + b_2X_1^2 + \hat{\rho}_1\mu_{t-1} + \varepsilon_t)$$
$$= E(\alpha_1 + b_1X_1 + b_2X_1^2 + \hat{\rho}_1\mu_{t-1}) + E(\varepsilon_t)$$

but $E(\varepsilon_t) = 0$

$E(\alpha_1) = \alpha_1$ since α_1 is a constant

$E(b_1X_1 + b_2X_1^2) = b_1X_1 + b_2X_1^2$ since X is non-stochastic

$E(\hat{\rho}_1\mu_{t-1}) = \hat{\rho}_1\mu_{t-1}$ since μ_{t-1} is non-stochastic as it is defined in the autoregressive procedures.

Then when B is added we have

$$E(A + B) = E(A) + E(B)$$

where $E(A) \to \alpha_2$ and

$$E(B) = b_{11}X_1 + b_{22}X_1^2 + \hat{\rho}_2\mu_{t-1}$$

$$A_I + B_d \text{ with}$$

$$Y_{fcst} = \overbrace{[\alpha_1 + b_1X_1 + b_2X_1^2 + \rho_1\mu_{t-1}]}^{A_{(I)}} + \overbrace{b_{11}X_d + b_{22}X_d^2 + \rho_2\mu_{t-1}}^{B_{(d)}}$$

where A_I becomes α_2 in the equation for B

and $Y_{fcst} = A_I + B_{11}X_d + b_{22}X_d^2 + \rho_2\mu_{t-1}$

This forecast carries the Var(A) and the Var(B) in its two sections. And the variance of the forecast = Var(A + B) =

$$\text{Var(A)} + \text{Var(B)} + 2\text{Cov(AB)}$$

however, if $A \perp B$, Cov(AB) = 0

$\therefore$ Var(forecast) = Var(A) + Var(B).[2]

and $\sigma_{fcst} = \text{Var(A)} + \text{Var(B)}$

Example: if Var(A) = 3 and

Var(B) = 2

$\sigma_{fcst} = \text{Var(A)} + \text{Var(B)}$

$= 3 + 2 = 5$

$= 2.33$

and a 99% confidence interval for $Y_{fcst} = 3\sigma = \pm\ 6.69$ units from the mean.

---

[2]If the forecast of values from A or B is for an X which is outside of the range of the data, the standard error of the forecast must be substituted for Var(A) and/or Var(B).

EXHIBIT I

REPORT ON BUDGET EXECUTION

DOD COMPONENT: DEPARTMENT OF THE AIR FORCE
APPROPRIATION TITLE: NATIONAL GUARD PERSONNEL, AIR FORCE 3850

PERIOD ENDING 31 March 1978
PAGE 4 OF 32 PAGES

	57 8 3850	57 7 3850	57 6 3850	57 M 3850	TOTAL
BUDGETARY RESOURCES					
BUDGET AUTHORITY					
1A APPROPRIATIONS REALIZED	231,800,000				231,800,000
1B OTHER NEW AUTHORITY REALIZED					
1C NET TRANSFERS OF CY AUTH REALIZED					
1D ANTICIPATED RESOURCES					
1 *TOT BUDGET AUTHORITY*	231,800,000				231,800,000
UNOBLIGATED BALANCE					
2A BROUGHT FORWARD JULY 1					
2B NET TRANSFERS OF PY BALANCES					
2C ANTIC TRANSFERS OF PY BALANCES					
2 *TOT UNOBLIGATED BALANCE*					
REIMBURSEMENTS AND OTHER INCOME					
3A EARNED	118,000	2,064			120,064
3B CHANGE IN UNFILLED CUSTOMER ORDERS					
3C ANTICIPATED ORDERS FOR REST OF YEAR	118,000				118,000
3 *TOT REIMBURSEMENTS AND OTHER INCOME*	236,000	2,064			238,064
3D MEMO: ADJUSTMENT TO PY ORDERS		2,064			2,064
4 RECOVERIES OF PRIOR OBLIGATIONS		2,305,928	2,920,456		5,226,385
5 RESTORATIONS (+) AND WRITE-OFFS (-)					
6 TOT BUDGETARY RESOURCES	232,036,000	2,307,992	2,920,456		237,264,449
STATUS OF BUDGETARY RESOURCES					
7 OBLIGATIONS INCURRED	109,480,663			7,097	109,487,760
UNOBLIGATED BALANCES AVAILABLE					
8A COMMITMENTS OUTSTANDING	5,405,121				5,405,121
8B INITIATIONS OUTSTANDING					
8C RESERV FOR ANTIC RESOURCES-AUTO APORT					
8D RESERV FOR OTH ANTIC RESOURCES	118,000				118,000
8E OTHER BALANCES CURRENTLY AVAILABLE	2,096,215				2,096,215
8 *TOT UNOBLIGATED BALANCES AVAILABLE*	7,619,336				7,619,336
UNOBLIGATED BALANCES NOT AVAILABLE					
9A APPORTIONMENTS FOR SUBSEQUENT PERIODS	114,936,000				114,936,000
9B RESERVED BY APPORTIONMENT ACTION					
9C BALANCE SUBJECT TO FUTURE APPOR ACT					
9D BALANCE IN EXPIRED ACCOUNTS		2,307,992	2,920,456	-7,097	5,221,352
9 *TOT UNOBLIGATED BAL NOT AVAILABLE*	114,936,000	2,307,992	2,920,456	-7,097	120,157,352
10 *TOT BUDGETARY RESOURCES*	232,036,000	2,307,992	2,920,456		237,264,449
RELATION OF OBLIGATIONS TO DISBURSEMENTS					
OBLIGATED BALANCE, NET, AS OF JULY 1					
11A GROSS UNPAID OBLIGATIONS		13,930,055	2,944,291	20,312	16,894,659
11B UNCOLLECTED REIMBURSABLE ORDERS		25,472	3,889		29,362
11 *TOT OBLIG BAL, NET, AS OF JULY 1*		13,904,583	2,940,401	20,312	16,865,297
OBLIGATED BALANCE, TRANSFERRED					
12A OBLIGATIONS TRANSFERRED					
12B REIMBURSEMENTS TRANSFERRED					
12 *TOT OBLIGATED BALANCE TRANSFERRED*					
OBLIGATED BALANCE, NET, END OF PERIOD					
GROSS UNPAID OBLIGATIONS					
13A1 UNDELIVERED ORDERS	418,609	99,024	1,177		518,811
13A2 ACCTS PAYABLE AND ACCRUED LIABILITIES	10,890,421	311,062	17,205	21,772	11,240,461
13A3 ADVANCES, PREPAYMTS, REFUNDS DUE (-)	-72,083	-16,045	-12,980	-518	-101,627
13A *TOT GROSS UNPAID OBLIGATIONS*	11,236,947	394,041	5,402	21,254	11,657,645
UNCOLLECTED REIMBURSABLE ORDERS					
13B1 REIMBURSEMENTS RECEIVABLE	38,632	17,863	3,889		60,385
13B2 UNEARNED REVENUES (-)					
13B3 UNFILLED CUSTOMER ORDERS					
13B *TOT UNCOLLECTED REIMBURSABLE ORDERS*	38,632	17,863	3,889		60,385
13 *TOT OBLIGATED BAL, NET, END OF PERIOD*	11,198,314	376,178	1,513	21,254	11,597,260
OUTLAYS, CASH BASIS					
14A DISBURSEMENTS *(NET OF REFUNDS)*	98,243,716	11,230,086	18,431	6,155	109,498,389
14B REIMBURSEMENTS COLLECTED	79,367	9,673			89,041
14 *TOT OUTLAYS, CASH BASIS*	98,164,348	11,220,412	18,431	6,155	109,409,348
CHANGE IN NET ACCOUNTS PAYABLE					
15A NET ACCOUNTS PAYABLE END OF PERIOD	10,779,704	277,154	335	21,254	11,078,448
15B ADJUSTMENTS IN NET ACCOUNTS PAYABLE					
15C NET ACCOUNTS PAYABLE AS OF JULY 1		13,016,664	2,933,821	20,312	15,970,798
15 *TOT CHANGE IN NET ACCOUNTS PAYABLE*	10,779,704	-12,739,510	-2,933,486	941	-4,892,350
ACCRUED EXPENDITURES (NET) + NL					
16A ACCRUED EXPENDITURES	109,062,053	-1,517,033	-2,915,054	7,097	104,637,062
16B ACCRUED REVENUES	118,000	2,064			120,064
16 *TOT ACCRUED EXPENDITURES (NET) + NL*	108,944,053	-1,519,098	-2,915,054	7,097	104,516,998

DATE	TYPED NAME OF AUTHORIZED OFFICER	SIGNATURE OF AUTHORIZED OFFICER
	MARTIN K. TARNOFF Deputy Director Accounting Operations	

DD FORM 1 SEP 71 1176 PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

4

EXHIBIT II

COMPUTER PROGRAM FOR CONVERTING DATA

```
L PERCENTAGE
DATE 11/22/78          TIME IS  7:58
SYSTEM/DUMPALL VERSION  2.9.170

LASTRECORD =        509
MAXRECSIZEIN =      15   BLOCKSIZEIN =  420
*** EBCDIC ***           UNITS=WORDS

BEGIN
%**************************************************************
%**78*  THIS PROGRAM IS USED TO READ AND ANALYZE      *78******
%*****  DATA FROM THE BUDGET TAPE (972 CHARACTERS A   *********
%*****  RECORD).   FOLLOWING ARE STEPS TAKEN TO       *********
%*****  ACCOMPLISH THIS TASK....                      *********
%*****   1. IF YOU NEED TO READ DATA FROM TAPE HAVE   *********
%*****     THE TAPE PUT ON USERPACK AND LOAD UNDER    *********
%*****      A NAME YOU TYPE IT ON FILE THREE.         *********
%*****   2. TO READ ONLY CERTAIN PARTS OF THE DATA,   *********
%*****     PUT YOUR FORMATTING IN FORMAT RINFOR AND   *********
%*****     USE THE READINFORMATION PROCEDURE COMMAND  *********
%*****   3. TO READ ONLY CERTAIN TREASURY CODE DATA   *********
%*****     USE THE USEFULDATA PROCEDURE COMMAND AND   *********
%*****     REFER TO THE LOCAL PROCEDURE DOCUMENTA-    *********
%*****     TION FOR FUTHER INSTRUCTIONS.              *********
%*****   4. IF YOU NOW WANT TO FIND %-CHANGE IN THE   *********
%*****     DATA USING THE END TOTAL AMOUNT USE        *********
%*****     NUMBERED PROCEDURE (1) AND REFER TO EACH   *********
%*****     PROCEDURE'S INSTRUCTIONS THAT ARE USED     *********
%*****     IN THE NUMBERED PROCEDURE DESIGNATED...    *********
%*****     THIS REFERENCE TO LOCAL PROCEDURE IN-      *********
%*****     STRUCTIONS WILL BE LABLED AS "LPI"...      *********
%*****     ALL NUMBERED PROCEDURES ARE FOUND AT END   *********
%*****     OF PROGRAM.....                            *********
%*****   5. IF THE PROGRAM HAS NOT ENDED AND YOU      *********
%*****     WANT TO USE THE OBLIGATION AUTHORITY       *********
%*****     AMOUNT TO FIND THE %-CHANGE, THEN USE THE  *********
%*****     NUMBERED PROCEDURE (2) AND LPI.            *********
%*****   6. IF THE PROGRAM YEAR IS ONLY A YEAR LONG   *********
%*****     ( 12 MONTHS ) THEN USE THE NUMBERED PRO-   *********
%*****     CEDURE (3) AND LPI.........                *********
%*****   7. IF THE PROGRAM IS A POSSIBLE YEARLY ONE   *********
%*****     ( 12 MONTHS )   BUT HAS NOT RUN TO         *********
%*****     COMPLETION, USE THE NUMBERED PROCEDURE (4) *********
%*****     AND LPI.........                           *********
%*****   8. IF YOU HAVE A TRUST FUND AND PRESERVING   *********
%*****     THE NEGATIVE SIGNS IS NEEDED IN            *********
%*****     COMPUTING THE %-CHANGE, THEN USE THE       *********
%*****     NUMBERED PROCEDURE (5) AND LPI.....        *********
%*****      IF THE ABOVE IS NOT NECESSARY THEN USE    *********
%*****     PROPER NUMBERED PROCEDURE FOR EITHER A     *********
%*****     MULTI-YEAR OR YEARLY DATA SITUATION.       *********
%*****   9. IF THE DATA IS A STOCK FUND, THEN USE     *********
%*****     THE NUMBERED PROCEDURE (6) TO KEEP THE     *********
%*****     NEGATIVE SIGNS IN THE DATA.. OTHERWISE     *********
%*****     HANDLE AS A MULTI-YEAR OR YEARLY DATA      *********
%*****     SETUP, IF NEGATIVE SIGNS ARE NOT PRESENT   *********
%*****     OR NEEDED IN THE %-CHANGE COMPUTATION..    *********
%**************************************************************
%**************************************************************
FILE ONE(KIND=DISK,TITLE="DUDE.",MAXRECSIZE=14,BLOCKSIZE=420,
        UNITS=WORDS, PROTECTION=SAVE);
FILE  INFO(KIND=DISK,TITLE="MARUNIACK/TAPE.",MAXRECSIZE=972,
        BLOCKSIZE=972,UNITS=CHARACTERS, PROTECTION=SAVE);
FILE TWO(KIND=DISK,TITLE="DETRUTH1.",MAXRECSIZE=14,BLOCKSIZE=420,
        PROTECTION=SAVE);
FILE THREE(KIND=DISK,TITLE="CLARKTAPE.",MAXRECSIZE=972,BLOCKSIZE=972,
        UNITS=CHARACTERS, PROTECTION=SAVE);
FILE PRN(KIND=PRINTER);
FILE TEN(KIND=PUNCH);
FILE SIX(KIND=DISK,TITLE="DETRUTH2.",MAXRECSIZE=14,BLOCKSIZE=420,
        UNITS=WORDS, PROTECTION=SAVE);
%=============================================================
%======  THE FOLLOWING NUMBER(S) IN THE FORMAT "RINFOR" ARE  ======
%======  USED TO READ CERTAIN DATA.... "602" IS THE NUMBER FOR======
%======  DISBURSEMENT INFORMATION, "617" IS FOR REIMBURSEMENTS,======
%======  "737" IS FOR OUTLAY INFORMATION....                ======
%=============================================================
    FORMAT RINFOR(I5,I4,X2,A4,X2,A4,I2,I1,I1,X109,I12,A1,X602, X617,737
                 I12,A1);
    FORMAT WDUDE(I12,A1,X1,I12,A1,X1,I4,X1,A4,X1,A4,X1,I2,
                 X1,I1,I1);
```

```
FORMAT RD(I13,X15,I4,X1,A4,X1,A4,X1,I2,X1,I1,I1);
FORMAT WD(F15.1,X1,F10.5,X1,F5.0,X1,F8.5,X5,A4,X20,I4,A1);
FORMAT RB12(X14,I15,X1,I4,X1,A4,X1,A4,X1,I2,X1,I1,I1);
ALPHA YRS,YR,NUM2,YEAR,YS,Y,OBN2,EXPN2,TRCD,YS1,Y1,IO;
INTEGER A,B,C,D,E,F,G,H,L,NUM1,TRES,MNTH,COL,PAGE,H4,M,CT,J,
      TRSCOD,NP,H5,H6,PLN,TRE,M,CL,PG,OBN1,EXPN1,M1,CL1,PG1;
  ALPHA ARRAY H2[0:4000], H3[0:4000], SBY[0:400], SBY1[0:400],
          H5[0:4000];
  ARRAY H1[0:4000], F1[0:4000], F2[0:4000], S1[0:4000], S2[0:4000],
      PN[0:4000], PT[0:4000], SBA[0:400], SBM[0:400];
PROCEDURE READINFORMATION;
 %$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
 %$$$$$$ PROCEDURE READINFORMATION READS THE MASTER DISK$$$$$$
 %$$$$$$ FILE AND TRANSFERS THE USEFUL DATA TO FILE ONE.$$$$$$
 %$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
    BEGIN
     LABEL YEAH;
     FOR L:=1 STEP 1 UNTIL 4700 DO
      BEGIN
       READ(THREE[L],RINFOR,PLN,TRE,YS,Y,M,CL,PG,OBN1,OBN2,
             EXPN1,EXPN2)[YEAH];
       WRITE(ONE,WOUDE,EXPN1,EXPN2,OBN1,OBN2,TRE,YS,Y,M,CL,PG);
      END;
   YEAH: END READINFORMATION;
PROCEDURE USEFULDATA;
 %$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
 %$$$$$$ PROCEDURE USEFULDATA READS ONLY THE TREASURY$$$$$$$
 %$$$$$$ CODE ITEM YOU WISH TO LOOK AT.  "TRSCOD" IS $$$$$$$
 %$$$$$$ THE CONTROL VARIABLE.                        $$$$$$$
 %$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
 BEGIN
  LABEL OAKLAND;
     TRSCOD:=9003;
    FOR L:=1 STEP 1 UNTIL 4800 DO
     BEGIN
      READ(ONE[L],WOUDE,EXPN1,EXPN2,OBN1,OBN2,TRCD,YS1,Y1,M1,CL1,
            PG1)[OAKLAND];
        IF TRSCOD=TRCD AND YS1 NEQ "M   " AND Y1 NEQ " 76T" AND
      Y1 NEQ " 72 " AND M1 NEQ 13 THEN
          BEGIN
           WRITE(SIX,WOUDE,EXPN1,EXPN2,OBN1,OBN2,TRCD,YS1,Y1,M1,
                 CL1,PG1);
          END;
     END;
 OAKLAND: END USEFULDATA;
 %$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
 %$$$$$$ BEFORE ANYMORE PROCEDURES CAN BE USED, THE SPECIAL   $$$
 %$$$$$$ CHARACTERS MUST BE CHANGED, I.E. 2986L TO -29863...  $$$
 %$$$$$$ OTHERWISE YOU WILL GET A FORMAT ERROR.. THE SPECIAL  $$$
 %$$$$$$ CHARACTERS ARE FOUND IN THESE COLUMNS IN FILE SIX--- $$$
 %$$$$$$ COL 13-13 AND COL 27-27.  THE SPECIAL CHARACTERS ARE;$$$
 %$$$$$$         J  K  L  M  N  O  P  Q  R  #                 $$$
 %$$$$$$        -1 -2 -3 -4 -5 -6 -7 -8 -9 -0                 $$$
 %$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
 %&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&
 %&&&&&&  PROCEDURE COMPERCENTAGE COMPUTES THE DATA TO BE     &&&
 %&&&&&&  CHANGED INTO A %-RANGE SCHEME.  "YEAR" IS THE        &&&
 %&&&&&&  CONTROL VARIABLE FOR THE PROGRAM YEAR(S) DESIRED..  &&&
 %&&&&&&  "NP" IS THE CONTROL VARIABLE FOR THE TOTAL TIME OF  &&&
 %&&&&&&  THE PROGRAM..  "TRSCOD" IS THE TREASURY CODE BEING  &&&
 %&&&&&&  COMPUTED..  "IO" IS THE DESIGNATOR FOR DISBURSEMENTS&&&
 %&&&&&&  (A), OR REIMBURSEMENTS(R), OR BLANK FOR OUTLAYS..   &&&
 %&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&
      PROCEDURE COMPERCENTAGE;
       BEGIN
          LABEL GETOUT;
   A:=1; B:=1; C:=1; D:=1; E:=1; G:=0; H4:=0; M:=1;
        YEAR:="XAP ";   NP:=72;  TRSCOD:=4921; IO:="A";
 FOR L:=1 STEP 1 UNTIL 4800 DO
    BEGIN
     READ(SIX[L],RD,H1[A],TRES,H2[A],H3[A],SBM[A],COL,PAGE)
             [GETOUT];
          A:=A+1;
    END;
GETOUT: FOR B:=1 STEP 1 UNTIL A DO
   BEGIN
     IF YEAR=H2[B] THEN
               BEGIN
                IF SBM[B] NEQ 12 THEN
                  BEGIN
                   F1[C]:=H4+H1[B]; F2[C]:=G+SBM[B];
                   S1[I]:=F1[C]; C:=C+1;
                  END;
                IF SBM[B]=12 THEN
                  BEGIN
                   F1[C]:=H4+H1[B]; F2[C]:=G+SBM[B];
                   S1[I]:=F1[C]; H4:=F1[C]; H5:=0;
                   G:=G+12; C:=C+1;
```

```
                END;
            IF SBM[B]=9 AND H3[B]=" 70 " THEN
                BEGIN
                  F1[C]:=H4+H1[B]; F2[C]:=G+SBM[B];
                  S1[1]:=F1[C]; H4:=F1[C]; C:=C+1;
                END;
          END;
        END;
      END CUMPERCENTAGE;
%$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
%$$$$$$  PROCEDURE NONMULTIYEAR READS DATA THAT ONLY     $$$$$$$$$
%$$$$$$  RUNS ONE YEAR OR ANNUALLY... "YEAR" IS THE      $$$$$$$$$
%$$$$$$  CONTROL VARIABLE FOR THE PROGRAM YEAR(S)        $$$$$$$$$
%$$$$$$  DESIRED.. "TRSCOD" IS THE TREASURY CODE         $$$$$$$$$
%$$$$$$  BEING COMPUTED, AND "ID" IS THE DESIGNATOR      $$$$$$$$$
%$$$$$$  FOR DISBURSEMENTS(A), REIMBURSEMENTS(B) AND     $$$$$$$$$
%$$$$$$  BLANK FOR OUTLAYS...                            $$$$$$$$$
%$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
PROCEDURE NONMULTIYEAR;
  BEGIN
    LABEL JUNK, FINAL;
   A:=1; B:=1; C:=1; D:=1; E:=1; G:=0; H4:=0; W:=1;
              YEAR:=" 78 ";    NP:=12;  TRSCOD:=9003;  ID:="A";
   JUNK: READ(SIX/RD,H1[A],TRES,H2[A],H3[A],SBM[A],COL,
                   PAGE)[FINAL];
      A:=A+1;    GO TO JUNK;
   FINAL: FOR B:=1 STEP 1 UNTIL A DO
        BEGIN
          IF YEAR=H3[B] THEN
            BEGIN
              IF H3[B]=H3[B+1] THEN
                BEGIN
                  H5:=H4+H1[B]; F2[C]:=G+SBM[B]; F1[C]:=H5;
                  C:=C+1;
                END;
          IF H3[B] NEQ H3[B+1] THEN
                BEGIN
                  H5:=H4+H1[B]; F1[C]:=H5; F2[C]:=G+SBM[B];
                  S1[E]:=H5; S2[E]:=C; E:=E+1;
                END;
        END;
      END;
   END NONMULTIYEAR;
%$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
%$$$$$$$  TRUSTFUNDS PROCEDURE HANDLES DATA FOR FUNDS AND   $$$$$$$
%$$$$$$$  TRUSTS. % CHANGE OF DATA IS DIVIDED BY ABS OF     $$$$$$$
%$$$$$$$  THE PREVIOUS DATA POINT... USE THIS ONLY TO PRE-  $$$$$$$
%$$$$$$$  SERVE NONCUMMULATIVE DATA WITH NEGATIVE SIGNS..   $$$$$$$
%$$$$$$$  "YEAR" IS THE PROGRAM YEAR DESIRED.. "NP" IS THE  $$$$$$$
%$$$$$$$  TOTAL TIME IN MONTHS THE PROGRAM WILL RUN..       $$$$$$$
%$$$$$$$  "TRSCOD" IS THE PROGRAM BEING LOOKED AT.. "ID" IS $$$$$$$
%$$$$$$$  THE DESIGNATOR FOR DISBURSEMENT(A), REIMBURSE-    $$$$$$$
%$$$$$$$  MENTS(B), AND BLANK FOR OUTLAYS.                  $$$$$$$
%$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
  PROCEDURE TRUSTFUNDS;
    BEGIN
      LABEL WORKOK, DONEOK;
       YEAR:="R75 ";  NP:=12;  TRSCOD:=8418; ID:="A";
    A:=1; B:=1; C:=1; D:=1; E:=1; G:=0; H4:=0; W:=1; S1[1]:=1;
   WORKOK: READ(SIX,RD,H1[A],TRES,H2[A],H3[A],SBM[A],COL,
                  PAGE)[DONEOK];
      A:=A+1;    GO TO WORKOK;
    DONEOK: FOR B:=1 STEP 1 UNTIL A DO
        BEGIN
          IF YEAR=H3[B] THEN
            BEGIN
              IF H3[B]=H3[B+1] THEN
                BEGIN
                  F1[C]:=(H1[B+1]-H1[B])/(ABS(H1[B]));
                  F2[C]:=G+SBM[B]; C:=C+1;
                END;
            END;
        END;
    END TRUSTFUNDS;
%$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
%$$$$$$$$$$ STOCKS PROCEDURE HANDLES STOCK-FUND DATA$$$$$$$$
%$$$$$$$$$$ USE THIS ONLY TO PRESERVE NONCUMMULATIVE$$$$$$$$
%$$$$$$$$$$ DATA WITH NEGATIVE SIGNS.. "YEAR" IS THE$$$$$$$$
%$$$$$$$$$$ PROGRAM YEAR DESIRED.. "NP" IS THE TOTAL$$$$$$$$
%$$$$$$$$$$ TIME IN MONTHS THE PROGRAM WILL RUN..    $$$$$$$$
%$$$$$$$$$$ "TRSCOD" IS THE PROGRAM BEING LOOKED AT $$$$$$$$
%$$$$$$$$$$  "ID" IS THE DESIGNATOR FOR DISBURSEMENT$$$$$$$$
%$$$$$$$$$$ (A) REIMBURSEMENTS(B) AND FOR OUTLAYS   $$$$$$$$
%$$$$$$$$$$ LEAVE IT BLANK.                          $$$$$$$$
%$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
PROCEDURE STOCKS;
    BEGIN
      LABEL GREENBAY, RAIDERS;
```

```
        YEAR:="AEK"";  NP:=92;  TRSCOD:=4921;  ID:="A";
     A:=1; B:=1; C:=1; D:=1; E:=1; G:=0; HW:=0; H:=1; S1[1]:=1;
     GREENBAY: READ(SIX,RD,H1[A],TRES,H2[A],H3[A],SBM[A],COL,
                        PAGE)[RAIDERS];
          A:=A+1;  GO TO GREENBAY;
     RAIDERS: FOR B:=1 STEP 1 UNTIL A DO
                   BEGIN
                    IF YEAR=H2[B] THEN
                      BEGIN
                        F1[C]:=(H1[B+1]-H1[B])/(ABS(H1[B]));
                        F2[C]:=G+SBM[B];  C:=C+1;
                      END;
              IF H3[B] NEQ H3[B+1] THEN G:=G+12;
                   END;
       END STOCKS;
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$$  PROCEDURE NONOBLIGATED DIVIDES DATA YEARLY SUMS  $$$$$$$
$$$$$$$$  BY SUM-TOTAL TO COMPUTE THE %-CHANGE.. FOR       $$$$$$$
$$$$$$$$  PROGRAM YEAR(S) THAT ARE NOT COMPLETED AND YOU   $$$$$$$
$$$$$$$$  WANT TO PROG THE ENDING AMOUNT TO FIND THE %-    $$$$$$$
$$$$$$$$  CHANGE, PUT THE AMOUNT PROG'D OUT IN THE         $$$$$$$
$$$$$$$$  LOCATION S1[1]:=_______ LABELED THE TEMPORARY    $$$$$$$
$$$$$$$$  VARIABLE.. WHEN YOU WANT TO USE IT, REMOVE THE   $$$$$$$
$$$$$$$$  "%" SIGN AT THE START OF THE LINE.. DO NOT       $$$$$$$
$$$$$$$$  FORGET TO REPLACE IT WHEN YOU DO NOT NEED THAT   $$$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
        PROCEDURE NONOBLIGATED;
         BEGIN
           FOR E:=1 STEP 1 UNTIL E DO
              FOR H:=1 STEP 1 UNTIL C DO
                BEGIN
  %        S1[1]:=5000000; % TEMPORARY VARIABLE##########
                   PH[D]:=F1[D]/S1[1]; PT[D]:=F2[D]/NP;
                   D:=D+1;
                END;
        END NONOBLIGATED;
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$    WRITECPINFORMATION, WRITES DATA FOR NONOBLIGATED   $$$$$
$$$$$$$    OUTPUT TO THE FILE OUTPUT CALLED FOR.. THERE ARE   $$$$$
$$$$$$$    THREE POSSIBLE OUTPUTS:  "TWO" IN THE WRITE        $$$$$
$$$$$$$    STATEMENT WILL PUT THE OUTPUT IN A DISK FILE       $$$$$
$$$$$$$    TITLED, DFTRUTH1.. "TEN" WILL PUNCH CARDS FOR THE  $$$$$
$$$$$$$    OUTPUT..  "PRN" IS FOR THE LINE PRINTER..          $$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
          PROCEDURE WRITECPINFORMATION;
           BEGIN
            FOR L:=1 STEP 1 UNTIL C DO
             BEGIN
          WRITE(TWO,WD,F1[L],PH[L],F2[L],PT[L],YEAR,TRSCOD,ID);
             END;
         END WRITECPINFORMATION;
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$   PROCEDURE PERCENTAGETOTAL USES OBLIGATION         $$$$$$
$$$$$$$   AUTHORITIES TO FIND %-TOTALS IN PROGRAMS          $$$$$$
$$$$$$$   NOT YET COMPLETE....                              $$$$$$
$$$$$$$   !!!!WARNING!!!! MNTH HAS TO BE CHANGED FOR        $$$$$$
$$$$$$$   7879 OR 7980 DATA.. WHEN USING MULTIYEAR DATA     $$$$$$
$$$$$$$   THE "MNTH=12" MUST BE CHANGED TO "MNTH=9" FOR     $$$$$$
$$$$$$$   78 DATA YEARS.. FOR NONMULTIYEAR DATA IT IS       $$$$$$
$$$$$$$   AUTOMATIC!!! THE WRITE STATEMENT IN THIS PROCE-   $$$$$$
$$$$$$$   DURE IS FOR YOUR HELP, TO CHECK WHAT OBLIGATION   $$$$$$
$$$$$$$   IS BEING USED TO FIND THE %-CHANGE AMOUNT..       $$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
     PROCEDURE PERCENTAGETOTAL;
          BEGIN
          LABEL DONE, JOB1;
   FOR J:=1 STEP 1 UNTIL A DO
    BEGIN
     READ(SIX[J],RAI2,NUM1,TRES, YRS, YR, MNTH, COL, PAGE)
               [DONE];
        IF YRS=YEAR AND MNTH=12 AND COL=1 AND PAGE=1
          THEN GO TO JOB1;
        IF YR=YEAR AND MNTH=9 AND COL=1 AND PAGE=1
          THEN GO TO JOB1;
     END;
   JOB1: SBA[1]:=NUM1; SAY[1]:=YRS;
     WRITE(TWO,/,SBA[1]);
   DONE: FOR L:=1 STEP 1 UNTIL C DO
          BEGIN
                  HS[L]:=SAY[1];
                  PH[L]:=F1[L]/SBA[1];
                  PT[L]:=F2[L]/NP;
          END;
     END PERCENTAGETOTAL;
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$   PROCEDURE WRITEPTINFORMATION WRITES DATA FOR        $$$$$$
$$$$$$$   OBLIGATION AUTHORITY RESULTS.. THERE ARE THREE      $$$$$$
$$$$$$$   POSSIBLE OUTPUTS:  "TWO" IN THE WRITE STATEMENT     $$$$$$
```

```
%$$$$$$$  WILL PUT THE OUTPUT IN A DISK FILE TITLED, DETRUTH1$$$$$$
%$$$$$$$   "TEN" WILL PUNCH CARDS FOR THE OUTPUT..  "PRN"      $$$$$$
%$$$$$$$  IS FOR THE LINE PRINTER..                           $$$$$$
%$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
    PROCEDURE WRITEPTINFORMATION;
      BEGIN
          FOR L:=1 STEP 1 UNTIL C DO
          BEGIN
        WRITE(TWO,WD, F1[L], PN[L], F2[L], PT[L], YEAR,TRSCOD,ID);
          END;
%$$$$$$$$  TEMPORARY VARIABLE....                            $$$$$$$
      END WRITEPTINFORMATION;
%••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••
%•••••••    !!!!!PROCEDURE CONTROL COMMANDS!!!!!     •••••••••••••
%•••••••  TO ACTIVATE ANY OF THESE PROCEDURE COMMANDS •••••••••••••
%•••••••  REMOVE THE FIRST "%" SIGN..  CAUTION: THIS  •••••••••••••
%•••••••  PROGRAM SHOULD ONLY HAVE ONE PROCEDURE      •••••••••••••
%•••••••  COMMAND SET WITHOUT A "%" SIGN AT ONE TIME.. •••••••••••••
%••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••
%   READINFORMATION;
%   USEFULDATA;
%   CUMPERCENTAGE; NONOBLIGATED; WRITECPINFORMATION;        % 1
%   CUMPERCENTAGE; PERCENTAGETOTAL; WRITEPTINFORMATION;     % 2
    NONMULTIYEAR; NONOBLIGATED; WRITECPINFORMATION;         % 3
%   NONMULTIYEAR; PERCENTAGETOTAL; WRITEPTINFORMATION;      % 4
%   TRUSTFUNDS; NONOBLIGATED; WRITECPINFORMATION;           % 5
%   STOCKS; NONOBLIGATED; WRITECPINFORMATION;               % 6
%::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
%::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
%:::::::::          YEAH!!!!! THE END!!!!!           ::::::::::::::
%::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
%::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
    END.
```

RTD+E, AIR FORCE
3600
($ Thousands)

Disbursements

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
FY 76	0	0	0	0	0	0	0	0	0				
FY 77	0	0	0	0	2,103	2,137	2,137	2,095	2,137	1,881	2,351	1,924	16,765
FY 78	279,327	171,445	155,670	139,967	124,370	108,588	92,923	77,280	61,541	46,047	30,014	14,446	1,301,618
FY 79	23,027	154,962	176,639	198,387	220,240	241,886	263,636	285,522	307,136	328,881	350,800	372,385	3,023,506
TOTAL	302,354	326,407	332,309	338,354	346,713	352,611	358,696	364,897	370,814	376,809	383,165	388,755	4,341,889

EXHIBIT III

FORECASTS FOR 3600 (RDT+E) DISBURSEMENTS AND REIMBURSEMENTS

RTD+E, AIR FORCE
3600

FY 76 Disbursements

Equation is linear in the 99.8-100% range

∴ forecast no change for those so enter zero for all categories

TOA = 4,203,345,168

Month	Percent of Time	Percent of TOA	Cumulative Dollar Amount	Incremental Dollar Amount
40	.8333			
41	.85417			
42	.87500			
43	.89583			
44	.91667	99.8-100%	4,203,345,168	- 0 -
45	.93750			
46	.95833			
47	.97917			
48	1.00000			

RTD+E, AIR FORCE
3600

FY 77 Disbursements TOA = 4,274,980,100

Months 25, 26, 27, 28 from second half Quad from actual data

Months 28-36 from linear general curve.

FY 77--second half Quad = $Y = .998982 - .0014557(X) - .000750065(X^2)$

Month	Percent of Time	Percent of TOA	Cumulative Dollar Amount	Incremental Dollar Amount
25	.52083	.9980207	4266517349.0	-197504.0
26	.54167	.997973	4266314715.0	-202634.0
27	.56250	.997926	4266113791.0	-200924.0
28	.58333	.997878	4265908592.0	-205199.0

Linear general curve = $.978022 + .0238816X$

to match linear curve

for (28) $.997878 = a + .0238816(X)$

where $X = .58333$

$\therefore a = .9839471$

New linear equation is $Y = .9839471 + .0238816X$

Month	Percent of Time	Percent of TOA	Cumulative Dollar Amount	Incremental Dollar Amount
28	.53333	.997898	4265908592.0	-205199.0
29	.60417	.99837	4268011882.0	2103290.0
30	.625	.99887	4270149372.0	2137490.0
31	.64583	.99937	4272286863.0	2137491.0
32	.66667	.99986	4274381603.0	2094740.0
33	.68750	1.00036	4276519093.0	2137490.0
34	.70833	1.00086	4278400084.0	1880991.0
35	.72911	1.00135	4280751323.0	2351239.0
36	.7500	1.0018	4282675064.0	1923741.0

RTD+E, AIR FORCE
3600

FY 78 Disbursements

Forecast Using General Curve

Month 13 = .27083% of time

Equation for FY 78 bottom half of curve equals

$$Y = .0212361 + .913584X + 7.32459X^2$$

$$X = .27083$$

$$\therefore Y_{13} = .76344$$

Equation for general curve second half equals

$$Y = -.0155688 + 3.95112X - 3.88272X^2$$

$$.76344 = a + 3.95112(.27083) + (-3.88272(.27083)^2)$$

$$a = -.0218448$$

New Equation equals

$$Y = -.0218448 + 3.95112X - 3.88272(X^2)$$

RTD+E, AIR FORCE
3600

TOA = 4,655,466,000

Month	Percent of Time	Percent of TOA	Cumulative Dollar Amount	Incremental Dollar Amount
13	.27083	.76344	3554168963.0	279328000.0
14	.29167	.8002666	3725613947.0	171444984.0
15	.31250	.8337049	3881284816.0	155670869.0
16	.3333	.86377	4021251867.0	139967051.0
17	.35417	.890485	4145622641.0	124370774.0
18	.37500	.91381	4254211385.0	108588744.0
19	.39583	.93377	4347134487.0	92923102.0
20	.41667	.950370	4424415222.0	77280735.0
21	.43750	.963589	4485955827.0	61540605.0
22	.45833	.973480	4532003042.0	46047215.0
23	.47919	.979927	4562016831.0	30013789.0
24	.50000	.98303	4576462742.0	14445911.0

RDT+E, AIR FORCE
3600

FY 79 Disbursements TOA = $4,131,000,000

Month	Percent of TOA	Cumulative Dollar Amount	Incremental Dollar Amount
1	.00557432	23027515.0	23027515.0
2	.0430865	177990331.0	154962815.0
3	.085861	354630239.0	176639907.0
4	.133870	553016970.0	198386731.0
5	.187184	773257104.0	220240134.0
6	.245738	1015143678.0	241886574.0
7	.309557	1278779967.0	263636289.0
8	.378674	1564302294.0	285522327.0
9	.453023	1871438013.0	307135719.0
10	.532636	2200319316.0	328881303.0
11	.617555	2551119705.0	350800389.0
12	.707699	2,923,504,569.0	372384864.0

RTD+E, AIR FORCE
3600
(In Thousands of Dollars)

Reimbursements

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
FY 76	0	0	340	0	0	4,869	0	0	7,304				12,513
FY 77	7,159	6,657	6,193	5,691	5,207	4,713	4,222	3,739	3,245	2,761	2,263	1,788	53,638
FY 78	231,656	194,272	186,616	63,606	286,974	163,890	156,321	148,818	141,174	133,602	126,208	118,341	1,951,478
FY 79	0	1,578	6,472	8,694	10,922	13,139	15,361	17,5[illegible]2	19,806	22,028	24,262	26,474	166,328
TOTAL	238,815	202,307	199,621	77,991	303,103	186,611	175,904	170,149	171,529	158,391	152,733	146,603	2,183,757

RTD+E, AIR FORCE
3600

FY 76 Reimbursements

General Model

$$Y = -.00748270 + 2.47092X + (-1.51497)X^2$$

Based on 73/74 data

$$.97430 = a + 2.47092(.8333) + (-1.51497)(.8333)^2$$

$$a = -.0323$$

$$Y = -.0323 + 2.47092X + (-1.51497)X^2$$

Month	Percent of Time	Percent of Total Amount	Cumulative Dollar Amount	Incremental Dollar Amount
40	.83333	.97430	474426472.0	- 0 -
41	.85417	.97430	474426472.0	- 0 -
42	.87500	.97500	474767330.0	340858.0
43	.89583	.97500	474767330.0	- 0 -
44	.91667	.97500	474767330.0	- 0 -
45	.93750	.98500	479636739.0	4869409.0
46	.95833	.98500	479636739.0	- 0 -
47	.97917	.98500	479636739.0	- 0 -
48	1.00000	1.00000	486940852.0	7304113.0

RTD+E, AIR FORCE
3600

FY 77 Reimbursements — Total Amount = 371,732,210

Equation from general curve = $-.00748270 + 2.47092X - 1.51497X^2$

at 25: $.858209 = a + 2.47092X - 1.51497X^2$

$a = -.020478$

Equation is $Y = -.020478 + 2.47092X - 1.51497X^2$

Month	Percent of Time	Percent of Total Amount	Cumulative Dollar Amount	Incremental Dollar Amount
25	.52083	.85549	318013188.0	7159562.0
26	.54167	.8734	324670912.0	6657724.0
27	.56250	.89006	330863970.0	6193058.0
28	.58333	.90537	336555191.0	5691221.0
29	.60417	.91938	341763159.0	5207968.0
30	.625	.93206	346476724.0	4713565.0
31	.64583	.94342	350699602.0	4222878.0
32	.66667	.95348	354439228.0	3739626.0
33	.68750	.96221	357684450.0	3245222.0
34	.70833	.96964	360446420.0	2761970.0
35	.72911	.97573	362710269.0	2263849.0
36	.7500	.98054	364498301.0	1788032.0

RTD+E, AIR FORCE
3600

FY 78 Forecast Reimbursements

Equation = $-.147603 + 3.33897X + (-2.70299X^2)$

For Month 13 = $-.147603 + 3.33897\frac{(13)}{(.27083)} - 2.70299\left(\frac{13}{.27083}\right)^2$

$Y_{12} = .518202625$

$Y_{13} = .5584289$

General second half equation = $-.748270\times10^{-2} + 2.47092X - 1.51497X^2$

$.5584289 = a + 2.47092(.27083) - 1.51497(.27083)$

$\therefore a = .0003510$

$\therefore$ revised general equation is: $Y = .0003510 + 2.47092(X) - 1.51497(X^2)$

Multiply Y percentage by 575,884,0174

RTD+E, AIR FORCE
3600

Month	Percent of Time	Percent End Figure	Cumulative Dollar Amount	Incremental Dollar Amount
13	.27083	.5584289	321590278.4	23165668.9
14	.29167	.5921636	341017552.9	19427274.5
15	.31250	.624567	359678153.1	18661600.2
16	.3333	.655612	366038792.1	6360639.0
17	.35417	.685444	394736244.4	28697452.3
18	.37500	.713903	411125327.7	16389083.3
19	.39583	.7410476	426757469.0	15632141.3
20	.41667	.7668894	441639348.6	14881879.6
21	.43750	.7914038	455756799.7	14117451.1
22	.45833	.81460352	469117032.5	13360232.8
23	.47919	.836519	481737922.4	12620889.9
24	.5000	.85706853	493572068.2	11834145.8

RTD+E, AIR FORCE
3600

Month	Percent of Time	Percent End Figure	Cumulative Dollar Amount	Incremental Dollar Amount
13	.27083	.5584289	321590278.4	23165668.9
14	.29167	.5921636	341017552.9	19427274.5
15	.31250	.624567	359678153.1	18661600.2
16	.3333	.655612	366038792.1	6360639.0
17	.35417	.685444	394736244.4	28697452.3
18	.37500	.713903	411125327.7	16389083.3
19	.39583	.7410476	426757469.0	15632141.3
20	.41667	.7668894	441639348.6	14881879.6
21	.43750	.7914038	455756799.7	14117451.1
22	.45833	.81460352	469117032.5	13360232.8
23	.47919	.836519	481737922.4	12620889.9
24	.5000	.85706853	493572068.2	11834145.8

RDT+E, AIR FORCE
3600

FY 79 Reimbursements

FY 73 -- 263519407 Actual

FY 74 -- 311317837 Actual

FY 75 -- 292599944 Forecast

FY 76 -- 486940852 Forecast

FY 77 -- 371732210 Forecast

FY 78 -- 575884017 Forecast

FY 79 -- 410000000*

*Forecast based on a pattern of increases and decreases which indicates a decrease of 160 million from previous year.

Month	Percent of Total Amount	Cumulative Dollar Amount	Incremental Dollar Amount
1	.00000	0	0
2	.00384894	1578065.0	1578065.0
3	.0196348	8050268.0	6472203.0
4	.0408402	16744482.0	8694214.0
5	.0674794	27666554.0	10922072.0
6	.0995268	40805988.0	13139434.0
7	.136994	56167540.0	15361552.0
8	.179902	73759820.0	17592280.0
9	.228211	93566510.0	19806690.0
10	.281940	115595400.0	22028890.0
11	.341118	139858380.0	24262980.0
12	.405689	166332490.0	26474110.0

EXHIBIT IV

TREASURY CODE CATEGORIES

TREAS. CODE	TREAS. NAME
0003F	OFFSETTING RECEIPTS, AIR FORCE
0008F	RCPT CIV, AIR FORCE
1997F	UNAPPLIED APPN. FINANCED MAT. CHGS.-AF
1998F	UNAPPLIED STOCK FUND, AIR FORCE
3010F	AIRCRAFT PROCUREMENT, AIR FORCE
3020F	MISSILE PROCUREMENT, AIR FORCE
3041F	RECOV. UNDER FOR. MIL SALES PROG., A.F.
3080F	OTHER PROCUREMENT, AIR FORCE
3199F	DISCONTINUED PROCUREMENT APPROP., AF
3300F	MILITARY CONSTRUCTION, AIR FORCE
3400F	OPER. AND MAINT., AIR FORCE
3499F	MISC. EXPRD, AIR FORCE
3500F	MILITARY PERSONNEL, AIR FORCE
3600F	RDT+E, AIR FORCE
3700F	RESERVE PERSONNEL, AIR FORCE
3730F	MIL. CON., AIR FORCE RESERVE
3740F	OPER. AND MAINT., AIR FORCE RESERVE
3830F	CON., AIR NATIONAL GUARD
3840F	OPER. AND MAINT., AIR NAT'L GUARD
3850F	NATIONAL GUARD PERSONNEL, AIR FORCE
3875F	BUDGET CLEARING ACCOUNT (SUSPENSE), A.F.
3960F	AIR FORCE MANAGEMENT FUND
4080F	DEF. PROD. GUAR., AIR FORCE
4921F	AIR FORCE STOCK FUND
4922F	AIR FORCE INDUSTRIAL FUND
5095F	WILDLIFE, AIR FORCE
8418F	AIR FORCE CADET FUND (T. REV)
8420F	SURCHRGE COLL., SALES OF COMM-STORES, AF (TR)
8928F	AIR FORCE GENERAL GIFT FUND (TRUST)
9003F	FEDERAL INTERFUND, AIR FORCE
9083F	INTRAGOVERNMENTAL TRUST FUND, AIR FORCE

0003A OFFSETTING RECEIPTS, AIR FORCE

General Equation = $1.15658 - 11.4155X_t + 11.4666X_t{}^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.978	198.42	1.58	0.336 0.249	.142 2.49	.000709
FY 74	.616	6.61	2.24	1.10 1.09	.712 .907	.0367
FY 75	.363	3.57	1.78	3.23 2.59	-2.51 2.63	.218
FY 76	-.094	.134	3.16	1.60	-.366	2.31
FY 77	-.264	.165	1.99	24.61 19.03	0.450 -.392	14.44
FY 78	0.104	1.46	3.47	54.79 64.12	-1.71 1.66	61.08
General Model	.025	1.79	2.02	7.17 6.43	-1.59 1.78	16.63

TABLE I

1997A AIR FORCE UNAPPLIED APPROPRIATION FINANCED MATERIAL CHARGES

General Equation = $4.64598 + 1.76882X_t$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	-.0738	.244	1.34	0.253	.494	.0656
FY 74	.649	11.17	1.92	23.61 21.21	4.49 -4.71	28.96
FY 75	.541	12.81	1.23	0.239	3.58	.0439
FY 76	-.072	.331	.982	2.16	-.576	3.57
FY 77	.776	14.89	2.20	1.24 1.09	.0129 .922	.0341
FY 78	.236	3.48	.943	.435	-1.86	.0788
General Model	-.013	.152	2.52	4.53	.390	98.6

TABLE II

1998A UNAPPLIED STOCK FUND CHARGES, AIR FORCE

General Equation = $1.38571 - 0.161825X_t - 0.324694X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.707	13.06	2.07	0.483 0.435	-3.51 4.24	.0112
FY 74	.465	5.34	1.73	1.60 1.29	2.73 -2.34	.0433
FY 75	.422	8.29	1.85	0.265	-2.88	.0536
FY 76	.567	6.89	1.86	6.43 5.54	-.499 -.178	.434
FY 77	-.089	.178	2.64	0.342	.422	.0893
FY 78	-.0246	.808	1.72	.456	-.899	.0866
General Model	-.0019	.940	1.95	1.63 1.51	-.0995 -.216	.536

TABLE III

3010A AIRCRAFT PROCUREMENT, AIR FORCE (1st Part)

General Equation = $0.0171011 - 0.609185X_t + 5.34148X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73-75	.997	3766.5	2.01	.1257 .2500	-2.66 18.15	.00003	.400 / .583
FY 74-76	.991	1123.95	1.96	.2254 .4304	-.620 8.75	.00004	.400 / .522
FY 75-77	.995	1913.1	2.01	.1876 .3784	-6.53 18.11	.00007	.400 / .671
FY 76-78	.979	476.3	1.83	.5205 .9477	-.543 5.59	.00007	.400 / .695
FY 77-79	.999	9694.9	1.99	.0650 .1511	-6.26 31.04	.00001	.350 / .445
FY 78-80	.992	456.4	1.61	.0684 .3508	-6.54 11.48	.000001	.150 / .037
General Model	.976	2524.7	1.91	.0989 .2339	-6.16 22.84	.00076	.400 / .695

TABLE IV

3010A AIRCRAFT PROCUREMENT, AIR FORCE (2nd Part)

General Equation = $-0.779312 + 4.92341X_t - 3.43379X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73-75	.948	193.3	1.97	.4836 / .3755	8.46 / -7.14	.00002	.780 / .986
FY 74-76	.960	265.7	2.12	.4599 / .3552	10.94 / -9.37	.00004	.800 / .987
FY 75-77	.976	365.4	2.00	.3725 / .3081	10.65 / -8.96	.00007	.750 / 1.00
FY 76-78	.996	821.5	2.07	1.3710 / 1.4051	7.76 / -6.39	.00004	.550 / 1.00
FY 77-79							
FY 78-80							
General Model	.808	167.52	1.92	.5934 / .5015	8.30 / -6.85	.00254	.800 / 1.00

TABLE V

3010A AIRCRAFT PROCUREMENT, AIR FORCE (3rd Part)

General Equation = $0.948601 + 0.0554629X_t$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73-75	.826	62.9	.790	.0074	7.93	.000003
FY 74-76	.446	8.24	.980	.0219	2.87	.00001
FY 75						
FY 76						
FY 77						
FY 78						
General Model	.540	28.02	1.86	.0105	5.29	.00001

TABLE VI

3010B AIRCRAFT PROCUREMENT, AIR FORCE (1st Part)

General Equation = $-0.0343638 + 0.387557X_t + 1.97809X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73-75	.897	136.3	2.03	.7068 .9461	.450 2.59	.00052	.570 / .856
FY 74-76	.892	137.6	1.99	.5130 .6795	3.55 -.350	.00112	.617 / .862
FY 75-77	.959	374.4	2.02	.3539 .4910	3.16 2.24	.00036	.583 / .883
FY 76-78	.983	921.9	1.92	.1767 .2884	-1.15 10.75	.00059	.550 / .780
FY 77-79	.956	207.5	1.98	.2062 .5149	1.85 2.53	.00024	.350 / .319
FY 78-80	.976	162.6	2.75	.0388 .2268	.070 3.92	.000001	.150 / .019
General Model	.969	2661.6	1.96	.0855 .1417	4.53 13.96	.00251	.617 / .883

TABLE VII

3010B AIRCRAFT PROCUREMENT, AIR FORCE (2nd Part)

General Equation = $-0.171879 + 2.63909X_t - 1.48518X_t2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73-75	.711	30.49	1.99	.6804 .4112	5.14 -4.75	.000098
FY 74-76	.874	59.91	1.88	.5222 .3172	3.31 -2.82	.00002
FY 75-77	.926	63.34	1.87	2.2187 1.6630	2.76 -2.38	.00018
FY 76						
FY 77						
FY 78						
General Model	.844	155.7	2.04	.2962 .1893	8.91 -7.84	.00040

TABLE VIII

3020A MISSILE PROCUREMENT, AIR FORCE (1st Part)

General Equation = $-0.00498441 - 0.0902674X_t + 6.08521Xt2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73-75	.989	731.4	2.06	.4123 .9215	-.330 6.540	.00007	.333 / .582
FY 74-76	.995	1492.9	1.52	.3017 .7269	-2.08 11.04	.00006	.317 / .602
FY 75-77	.988	603.4	1.98	.4391 1.0967	2.12 3.82	.00008	.300 / .574
FY 76-78	.998	5624.1	1.93	.1005 .2839	-.0502 21.81	.00002	.300 / .543
FY 77-79	.987	482.6	1.92	.3615 .9036	3.86 1.12	.00002	.283 / .377
FY 78-80	.999	3433.9	1.66	.0430 .2518	-5.48 23.62	.000002	.150 / .100
General Model	.943	798.9	1.88	.2122 .6174	-.430 9.86	.00096	.333 / .602

TABLE IX

3020A MISSILE PROCUREMENT, AIR FORCE (2nd Part)

General Equation = $-0.392647 + 3.6333X_t - 2.31283X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73-75	.971	622.8	1.94	.0698 .0470	17.35 -13.72	.00001
FY 74-76	.797	73.44	1.57	.2147 .1536	8.03 -6.91	.00005
FY 75-77	.787	45.45	2.11	.3892 .3198	2.83 -2.01	.00002
FY 76-78	.966	187.8	1.89	.8001 .8646	2.27 -1.03	.00003
FY 77						
FY 78						
General Model	.676	132.5	2.01	.3661 .2908	9.92 -7.95	.01347

TABLE X

3020B MISSILE PROCUREMENT, AIR FORCE (1st Part)

General Equation = $-0.0602602 + 1.00796X_t + 4.56700X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73-75	.876	39.70	1.89	1.8729 5.5693	-1.01 2.34	.00134	.250 / .399
FY 74-76	.866	52.8	1.98	1.38 3.3192	1.45 .440	.00221	.317 / .571
FY 75-77	.821	19.34	2.18	5.4998 22.24	-2.73 3.55	.00650	.183 / .592
FY 76-78	.905	62.65	1.71	0.4188 1.1550	-.780 2.60	.00019	.283 / .142
FY 77-79	.864	36.1	1.98	2.5485 6.0773	4.92 -4.04	.00413	.300 / .909
FY 78-80	.835	41.55	1.95	0.0489	6.45	.00004	.150 / .042
General Model	.696	92.8	2.07	.7240 2.3112	1.39 1.98	.03865	.300 / .909

TABLE XI

3020B MISSILE PROCUREMENT, AIR FORCE (2nd Part)

General Equation = $0.0964414 + 2.09945X_t - 1.22692X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73-75	.703	50.8	2.02	.4567 .3293	5.52 -4.35	.00029
FY 74-76	-.0017	.970	1.98	.9661 .6658	1.27 -1.20	.00039
FY 75-77	.921	181.8	1.97	.2525 .2438	1.12 1.41	.00014
FY 76-78	.968	209.7	1.89	.3229 .3723	-3.22 4.71	.00005
FY 77						
FY 78						
General Model	.817	295.7	2.04	.1803 .1527	11.64 -8.04	.00614

TABLE XII

3080A OTHER PROCUREMENT, AIR FORCE (1st Part)

General Equation = $-.0156198 + 3.05875X_t - 2.34905X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73 - 75	.983	410.5	1.78	0.3269 0.9282	1.47 3.75	.00014	.280 / .677
FY 74 - 76	.941	128.1	1.92	0.5589 1.5528	5.19 -2.03	.00058	.300 / .654
FY 75 - 77	.958	162.2	2.05	0.8330 2.2385	6.46 -3.48	.0037	.283 / .691
FY 76 - 78	.987	551.2	2.27	0.3578 1.1367	10.06 -3.43	.00026	.266 / .585
FY 77 - 79	.999	10297.2	2.27	0.0911 0.3764	12.43 15.31	.00001	.200 / .473
FY 78 - 80	.999	18421.9	2.89	0.0644 0.3687	28.2 8.6	.000004	.150 / .346
General Model	.848	238.2	1.97	0.4478 1.4306	6.83 -1.64	.00310	.300 / .691

TABLE XIII

3080A OTHER PROCUREMENT, AIR FORCE (2nd Part)

General Equation = $.121960 + 2.19867X_t - 1.35749X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73 - 75	.586	29.3	2.07	0.1701 0.1133	3.93 -3.13	.0001
FY 74 - 76	.861	115.7	2.17	0.1804 0.1285	7.53 -5.94	.00002
FY 75 - 77	.991	1420.7	1.91	0.0991 0.0899	19.1 -13.8	.00001
FY 76 - 78	.999	8209.6	2.04	0.0839 0.1024	23.29 -11.4	.00001
FY 77 - 79	.999	24864.1	2.79	0.0904 0.1608	6.29 6.95	.000002
FY 78 - 80						
General Model	.947	1245.4	2.00	0.0787 0.0652	27.9 -20.8	.00108

TABLE XIV

3080B OTHER PROCUREMENT, AIR FORCE (1st Part)

General Equation = $-.0119572 + 0.515795X_t + 2.71884X_t{}^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73 - 75	.930	126.8	1.54	0.5456 1.2337	2.14 0.95	.00033	.350 / .480
FY 74 - 76	.902	42.3	1.84	0.2964 1.0868	0.58 0.85	.00002	.200 / .059
FY 75 - 77	.969	207.0	1.81	0.4891 1.5602	4.98 -1.14	.00018	.250 / .353
FY 76 - 78	.977	346.0	1.41	0.2402 0.6945	-1.02 6.51	.00022	.300 / .372
FY 77 - 79	.963	233.0	1.99	0.3204 0.7653	2.94 1.27	.00035	.350 / .480
FY 78 - 80	.988	325.6	2.21	0.1404 0.8215	-3.99 9.46	.00002	.150 / .103
General Model	.938	712.7	2.01	0.1479 0.4236	3.49 6.42	.00238	.350 / .480

TABLE XV

3080B OTHER PROCUREMENT, AIR FORCE (2nd Part)

General Equation = $-.0000114202 + 1.82678X_t - 0.770884X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73 - 75	.968	552.4	2.04	0.2118 0.1464	15.27 -11.84	.00012
FY 74 - 76	.796	82.9	1.94	0.3247 0.2435	5.36 -3.68	.00011
FY 75 - 77	.919	160.4	2.03	0.5497 0.5092	3.52 -1.48	.00045
FY 76 - 78	.946	124.3	1.89	1.2268 1.4004	-0.5869 1.7359	.00043
FY 77 - 79						
FY 78 - 80						
General Model	.851	368.9	2.02	0.2094 0.1695	8.73 -4.55	.0052

TABLE XVI

3300A MILITARY CONSTRUCTION, AIR FORCE

General Equation = $-0.0189489 + 1.05127X_t - 0.0427625X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.997	1821.39	2.26	0.0834 0.0719	12.39 -.279	.000323	1.00 / 1.00
FY 74	.999	9601.22	2.17	0.0327 0.0294	35.34 -3.75	.000055	1.00 / 1.00
FY 75	.996	1097.69	1.65	0.152 0.112	4.89 1.38	.000090	1.00 / 1.00
FY 76	.995	823.21	1.75	0.196 0.133	4.00 1.19	.000065	1.00 / 1.00
FY 77	.999	4680.44	1.83	0.0522 0.0422	16.65 1.55	.000043	1.00 / 1.00
FY 78	.996	920.43	1.74	1.11 0.130	8.44 1.07	.000252	.750 / .803
General Model	.997	10293.30	2.00	0.0303 0.0274	34.70 -1.56	.000303	1.00 / 1.00

TABLE XVII

3300B MILITARY CONSTRUCTION, AIR FORCE

General Equation = $-0.136148 + 1.23443X_t - 0.108036X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.938	84.04	2.34	0.434 0.390	6.01 -3.23	.00979	1.00 / 1.00
FY 74	.925	63.00	2.13	0.577 0.493	0.181 2.05	.0129	1.00 / 1.00
FY 75	.878	80.02	1.95	0.131	8.95	.0170	1.00 / 1.00
FY 76	.779	15.13	1.97	1.00 0.747	-2.15 2.84	.00872	1.00 / 1.00
FY 77	.648	10.19	1.98	0.987 0.814	1.25 -.390	.0211	1.00 / 1.00
FY 78	.832	20.84	2.12	1.02 1.19	-.0423 1.47	.0210	.750 / .854
General Model	.822	155.55	2.01	0.274 0.248	4.50 -.436	.0271	1.00 / 1.00

TABLE XVIII

3400A OPERATIONS AND MAINTENANCE, AIR FORCE (1st Part)

General Equation = $-.0388675 + 2.56074X_t + 0.636620Xt2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.999	4991.41	2.21	0.2198 0.4548	9.83 3.20	.00001	.333 / .886
FY 74	.998	3791.25	2.02	0.2098 0.4670	8.62 5.03	.000029	.333 / .862
FY 75	.999	24501.09	1.98	0.0690 0.1684	36.37 5.60	.000009	.333 / .899
FY 76	.999	26525.99	2.19	0.0532 0.1436	50.84 1.89	.000016	.333 / .892
FY 77	.999	9585.88	1.80	0.1293 0.2962	20.58 1.74	.000017	.333 / .893
FY 78	.999	10370.14	1.88	0.0948 0.3329	26.66 5.26	.000020	.250 / .704
General Model	.994	5803.3	1.98	0.1104 0.3015	23.18 2.11	.00040	.333 / .899

TABLE XIX

3400A OPERATIONS AND MAINTENANCE, AIR FORCE (2nd Part)

General Equation = $.784909 + .545739X_t - 0.341402X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.924	135.74	1.80	0.2988 0.0203	8.08 -6.42	.000001
FY 74	.950	210.22	1.96	0.0292 0.01973	10.18 -8.14	.000000
FY 75	.495	11.29	2.65	0.0402 0.0253	2.80 -2.40	.000000
FY 76	.975	371.94	1.85	0.0236 0.0171	13.05 -10.50	.000000
FY 77	.996	1005.93	1.91	0.0766 0.0782	11.77 -9.30	.000000
FY 78						
General Model	.676	112.05	2.24	0.05695 0.04281	9.58 -7.97	.00010

TABLE XX

3400B OPERATIONS AND MAINTENANCE, AIR FORCE (1st Part)

General Equation = $-.0769836 + 1.60478X_t + 2.95764X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.999	9798.69	2.03	0.1362 0.3003	13.06 8.68	.000074	.361 / .878
FY 74	.999	23925.96	1.99	0.0678 0.1570	23.04 20.13	.000015	.361 / .901
FY 75	.996	1395.56	1.96	0.2936 0.7141	6.92 3.07	.00016	.333 / .814
FY 76	.996	1392.99	2.42	0.2937 0.7168	8.83 1.11	.00015	.333 / .792
FY 77	.997	1972.31	2.11	0.1834 0.4946	4.64 9.80	.00019	.333 / .773
FY 78	.996	1311.83	1.92	0.2215 0.7778	2.41 8.94	.00011	.250 / .529
General Model	.991	4221.23	1.90	0.1263 0.3154	12.70 9.37	.00041	.388 / .941

TABLE XXI

AD-A071 036 AIR FORCE ACADEMY COLO F/G 15/5
DETERMINING GOVERNMENT DISBURSEMENTS FROM NORMALIZED SPENDING P--ETC(U)
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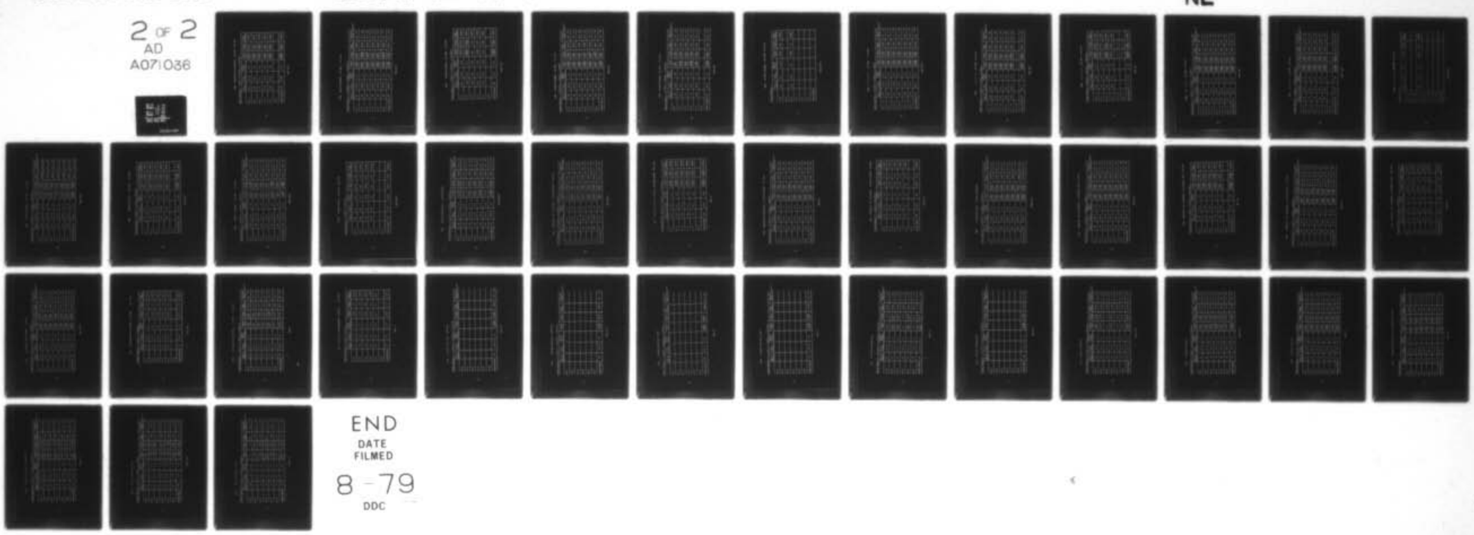

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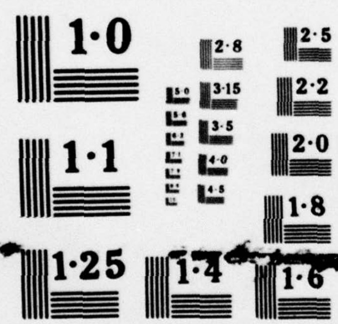

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3400B OPERATIONS AND MAINTENANCE, AIR FORCE (2nd Part)

General Equation = $.667403 + 0.879709X_t - 0.566748X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.921	112.21	1.57	0.0185 0.0120	8.53 -7.34	.000000
FY 74	.824	50.30	1.81	0.0386 0.0262	6.31 -5.44	.000002
FY 75	.425	9.15	2.42	0.0631 0.0434	0.925 -0.447	.000009
FY 76	.633	18.27	1.94	0.1086 0.0809	3.59 -3.02	.000021
FY 77	.908	40.76	1.38	0.7983 0.8201	4.63 -4.12	.000056
FY 78						
General Model	.413	36.60	2.15	0.1380 0.1013	6.37 -5.59	.000218

TABLE XXII

3500A MILITARY PERSONNEL, AIR FORCE (1st Part)

General Equation = $-0.00960268 + 3.02082X_t - 0.125214X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.999	74394.43	1.82	0.0475 0.1086	59.67 2.25	.000002	.333 / .973
FY 74	.999	672986.05	2.13	0.0127 0.0331	233.56 0.6405	.000000	.333 / .982
FY 75	.999	222221.0	1.93	0.0236 0.0575	129.50 -3.55	.000001	.333 / .984
FY 76	.999	516469.8	1.96	0.0175 0.0418	173.1 -2.97	.000000	.333 / .982
FY 77	.999	1317716.9	2.02	0.0092 0.0238	311.9 14.61	.000000	.333 / .992
FY 78	.999	779492.8	2.29	0.0113 0.0398	261.86 14.36	.000000	.250 / .779
General Model	.999	56406.78	2.00	0.0396 0.1058	76.27 -1.18	.00009	.333 / .992

TABLE XXIII

3500A MILITARY PERSONNEL, AIR FORCE (2nd Part)

General Equation = $0.975398 + 0.0633501X_t - 0.0415228X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.861	150.85	0.539	.002353	12.28	.000008
FY 74	-.0799	0.185	2.05	0.0145 0.0099	0.157 -0.089	.000000
FY 75	-.0079	0.810	0.399	.0039	0.900	.000015
FY 76	0.200	6.27	0.385	0.00386	2.505	.000010
FY 77	0.656	18.20	0.4648	.01361	4.266	.00004
FY 78						
General Model	.195	13.75	1.98	0.0170 0.0128	3.74 -3.22	.000027

TABLE XXIV

3500B MILITARY PERSONNEL, AIR FORCE (1st Part)

General Equation = $-0.0241049 + 1.17210X_t + 3.50730X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.995	1060.44	1.94	0.2643 0.7066	7.127 1.545	.000126	.305 / .639
FY 74	.996	1694.28	1.94	0.1687 0.4549	8.59 4.80	.000164	.333 / .691
FY 75	.993	859.99	1.83	0.2831 0.7632	6.74 2.79	.00046	.333 / .833
FY 76	.991	568.44	2.02	0.3964 0.9658	4.42 1.97	.000302	.333 / .718
FY 77	.989	454.60	2.15	0.3167 0.9256	-1.28 8.07	.000437	.305 / .628
FY 78	.988	342.44	1.94	0.452 1.58	-0.319 6.09	.00046	.250 / .560
General Model	.970	1092.52	2.00	0.2309 0.6217	5.07 5.64	.00244	.333 / .880

TABLE XXV

3500B MILITARY PERSONNEL, AIR FORCE (2nd Part)

General Equation = $0.570912 + 0.958992X_t - 0.566630X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.832	20.86	2.00	2.88 / 3.44	3.84 / -3.43	.00218	.527 / .996
FY 74	.525	12.64	2.02	0.8215 / 0.5550	-2.22 / 2.69	.00122	1.00 / 1.00
FY 75	.747	11.37	1.64	1.048 / 1.069	1.19 / -0.93	.00009	.583 / 1.01
FY 76	.747	30.64	2.10	0.2786 / 0.2109	3.98 / -3.19	.00022	.916 / .999
FY 77	.984	286.07	2.10	0.709 / 0.788	7.44 / -5.66	.00025	.583 / 1.01
FY 78							
General Model	.401	36.20	2.00	0.2112 / 0.1596	4.54 / -3.54	.00567	1.00 / 1.00

TABLE XXVI

3500B MILITARY PERSONNEL, AIR FORCE (3rd Part)

General Equation =

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.268	7.22	0.6039	0.00131	2.68	.000000
FY 74						
FY 75	.263	6.35	1.04	0.01863	-2.52	.000091
FY 76						
FY 77						
FY 78						
General Model						

TABLE XXVII

3600A R. D. T. & E., AIR FORCE (1st Part)

General Equation = $-.0533829 + 2.09841X_t + 3.17386X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73 - 74	.987	384.58	1.56	0.9539 2.2081	4.30 -0.57	.00009	.292 / .785
FY 74 - 75	.999	20115.9	2.45	0.0685 0.2461	22.89 23.31	.00002	.250 / .724
FY 75 -76	.999	12856.9	1.95	0.1273 0.3619	24.60 1.95	.00001	.271 / .813
FY 76 -77	.995	1255.1	1.87	0.4066 0.9259	8.51 -0.64	.00004	.313 / .842
FY 77 - 78	.996	1254.9	1.43	0.3822 1.1843	5.14 3.93	.00009	.250 / .695
FY 78 - 79	.998	1761.3	1.91	0.2528 1.0673	3.61 6.86	.00003	.188 / .187
General Model	.957	812.6	1.78	0.3062 0.9649	6.85 3.29	.00138	.313 / .842

TABLE XXVIII

3600A R. D. T. & E., AIR FORCE (2nd Part)

General Equation = $0.255954 + 2.67472X_t - 2.42934X_t2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73 - 74	.968	215.7	2.00	0.1667 0.1599	8.19 -6.70	.00001	.646 / .990
FY 74 - 75	.973	310.3	2.00	0.1449 0.1474	12.13 -9.94	.00001	.646 / .990
FY 75 - 76	.811	22.4	1.52	0.6230 0.6976	3.04 -2.64	.00001	.521 / .987
FY 76 - 77	.987	374.7	1.43	0.2462 0.2739	7.86 -6.15	.00001	.542 / .985
FY 77 - 78	.999	3166.7	2.04	0.2656 0.3853	21.08 -15.15	.00001	.438 / 1.00
FY 78 - 79							
General Model	.879	255.9	2.03	0.2108 0.2329	12.69 -10.43	.00035	.646 / .990

TABLE XXIX

3600A R. D. T. & E., AIR FORCE (3rd Part)

General Equation = $0.964555 + .0666514X_t - .0318087X_t2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73 - 74	.959	188.0	1.92	0.0253 0.0151	6.78 -5.79	.00000
FY 74 - 75	.652	32.8	0.35	0.0036	5.73	.00000
FY 75 - 76	.981	481.5	1.94	0.0067 0.0045	5.15 -2.94	.00000
FY 76 - 77	.860	44.1	1.30	0.0127	6.64	.00000
FY 77 - 78						
FY 78 - 79						
General Model	.718	79.9	2.01	0.0195 0.0127	3.42 -2.45	.000003

TABLE XXX

3600B R. D. T. & E. , AIR FORCE (1st Part)

General Equation = $-.005728 - .0174336X_t + 6.76169X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73 - 74	.960	120.4	2.07	1.1618 2.7595	-2.99 5.07	.00028	.292 / .434
FY 74 - 75	.994	978.3	1.48	0.2283 0.7616	-4.22 14.26	.00022	.270 / .534
FY 75 - 76	.997	1815.7	2.12	0.2078 0.6619	1.61 10.64	.00014	.271 / .582
FY 76 - 77	.994	870.9	2.08	0.3663 0.9972	-1.59 8.18	.00030	.292 / .545
FY 77 - 78	.981	202.9	1.92	0.9555 3.0688	1.10 1.96	.00027	.229 / .473
FY 78 - 79	.992	414.0	2.17	0.3062 1.2520	3.45 1.47	.00003	.188 / .207
General Model	.917	388.2	2.03	0.3067 1.0191	-.07 6.63	.00358	.292 / .582

TABLE XXXI

3600B R. D. T. & E., AIR FORCE (2nd Part)

General Equation = $-.0161484 + 2.50552X_t - 1.54611X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73 - 74	.726	44.68	2.04	0.3795 0.2642	4.68 -3.60	.00024	1.00 / 1.00
FY 74 - 75	.572	22.35	2.01	0.4039 0.2696	4.30 -3.66	.00010	1.00 / 1.00
FY 75 - 76	.789	25.34	2.08	1.4460 1.4865	3.17 -2.67	.00033	.604 / .970
FY 76 - 77	.600	13.01	2.18	1.5033 1.3432	1.85 -1.46	.00021	.688 / .954
FY 77 - 78	.995	1006.0	1.97	0.3962 0.5920	8.43 -4.57	.00006	.438 / .792
FY 78 -79							
General Model	.891	534.9	1.98	0.1360 0.1095	18.43 -14.12	.00217	1.00 / 1.00

TABLE XXXII

3600B R. D. T. & E., AIR FORCE (3rd Part)

General Equation =

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73 - 74						
FY 74 - 75						
FY 75 - 76	.277	7.12	1.47	0.0140	2.67	.00003
FY 76 - 77						
FY 77 - 78						
FY 78 - 79						
General Model						

TABLE XXXIII

3700A RESERVE PERSONNEL, AIR FORCE (1st Part)

General Equation = $-0.0294802 + 2.86084X_t - 0.0792989X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.998	4827.96	1.49	0.1236 0.3333	24.71 -2.30	.000088	.333 / .916
FY 74	.999	5634.12	1.39	0.1171 .3156	26.91 -2.707	.000079	.333 / .926
FY 75	.999	5419.69	1.24	0.1199 .3233	26.31 -2.56	.000083	.333 / .939
FY 76	.998	2446.54	1.54	0.2407 0.5475	12.49 -1.33	.000053	.333 / .934
FY 77	.999	5990.69	2.15	0.1766 0.3906	8.002 9.063	.000019	.333 / .895
FY 78	.999	6207.99	2.45	0.1153 0.4047	20.21 4.50	.00003	.250 / .674
General Model	.982	1861.1	1.97	0.2007 0.5428	14.25 -0.15	.00119	.333 / .895

TABLE XXXIV

3700A RESERVE PERSONNEL, AIR FORCE (2nd Part)

General Equation = $0.874494 + .3253X_t - 0.205984X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.6816	24.54	1.897	0.0334 0.0253	1.787 -0.999	.000003
FY 74	.2484	4.47	1.896	0.0101 0.0068	-0.593 0.279	.000000
FY 75	.7635	34.89	2.13	0.0015 0.0010	3.07 -2.22	.000000
FY 76	.9517	188.26	1.48	0.0039 0.003	11.47 -9.72	.000000
FY 77	.886	28.29	2.14	0.0665 0.0675	3.38 -2.99	.000000
FY 78						
General Model	.304	23.95	2.00	0.07083 0.05327	4.592 -3.86	.000217

TABLE XXXV

3700B RESERVE PERSONNEL, AIR FORCE (1st Part)

General Equation = $-0.0566536 + .387586X_t + 3.50443X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.8776	47.62	1.96	1.308 2.704	-2.272 4.173	.01207	.416 / .798
FY 74	.9461	106.38	2.18	0.9346 1.171	-2.51 4.89	.00700	.444 / .694
FY 75	.690	15.5	1.91	2.72 4.54	2.26 -1.39	.00629	.444 / .709
FY 76	.742	19.7	1.95	3.81 -3.34	1.79 3.07	.00401	.444 / .535
FY 77	.730	13.18	2.04	5.308 10.79	0.1766 0.5578	.02213	.361 / .833
FY 78	.892	34.17	2.06	1.45 5.09	-2.21 3.92	.00476	.250 / .487
General Model	.745	122.49	1.95	0.5362 1.137	0.7227 3.083	.01747	.444 / .535

TABLE XXXVI

3700B RESERVE PERSONNEL, AIR FORCE (2nd Part)

General Equation = $0.875681 + 0.154022X_t$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.086	2.99	1.18	0.0497	1.732	0.00168
FY 74	.090	3.00	1.19	.0825	1.732	0.00404
FY 75	.349	11.2	0.605	.000124	3.35	0.00000
FY 76	.106	3.03	1.21	0.169	1.174	0.01069
FY 77						
FY 78						
General Model	.113	11.28	1.034	0.0458	3.358	0.00458

TABLE XXXVII

3730A MILITARY CONSTRUCTION, AIR FORCE RESERVE

General Equation = $-0.0423363 + 1.36570X_t - 0.323255X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point % Time/% $
FY 73	.997	1691.14	1.91	0.0735 0.0661	15.94 -2.72	.000281	1.00 / 1.00
FY 74	.986	761.43	1.87	0.0334	27.59	.00111	1.00 / 1.00
FY 75	.996	995.66	2.12	0.154 0.115	13.71 -7.61	.000235	1.00 / 1.00
FY 76	.993	750.16	1.81	0.159 0.124	11.83 -4.92	.000266	1.00 / 1.00
FY 77	.996	1110.37	1.95	0.0976 0.0816	11.04 -1.90	.000257	1.00 / 1.00
FY 78	.997	234.71	2.75	0.0234	48.38	.000227	.750 / .832
General Model	.989	3054.09	2.06	0.0572 0.0514	23.87 -6.29	.00144	1.00 / 1.00

TABLE XXXVIII

3740A OPERATIONS AND MAINTENANCE, AIR FORCE RESERVE (1st Part)

General Equation = $-0.0222792 + 2.06168X_t + 2.42875X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-S
FY 73	.917	39.85	2.89	4.81 10.11	2.69 -1.68	.01022	.333 / .937
FY 74	.999	4493.6	1.94	0.1312 0.3356	16.6 5.13	.00010	.333 / .906
FY 75	.999	13350.6	1.95	0.0804 0.2167	30.8 6.72	.000037	.333 / .950
FY 76	.999	6537.42	1.88	0.1095 0.295	28.45 -2.36	.000069	.333 / .903
FY 77	.999	9755.44	2.14	0.0912 0.246	26.03 6.05	.000048	.333 / .931
FY 78	.997	1569.49	2.10	0.2329 0.818	11.08 1.32	.000123	.25 / .674
General Model	.940	487.72	2.00	0.421 1.11	4.90 2.19	.00473	.333 / .950

TABLE XXXIX

3740A OPERATIONS AND MAINTENANCE, AIR FORCE RESERVE (2nd Part)

General Equation = $0.831152 + 0.438409X_t - 0.232273X_t2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.882	72.22	1.73	0.0146 0.0096	6.05 -5.06	.000000
FY 74	.225	4.19	2.03	0.0438 0.0305	1.99 -1.74	.000007
FY 75	.929	153.35	1.81	0.0053 0.0023	9.69 -7.82	.000008
FY 76	.796	36.2	1.53	0.0244 0.0177	5.59 -4.94	.000000
FY 77	.711	10.8	2.26	0.2832 0.2947	2.52 -2.26	.000009
FY 78						
General Model	.263	19.74	2.02	0.0999 0.0752	4.39 -3.75	.000492

TABLE XL

3740B OPERATIONS AND MAINTENANCE, AIR FORCE RESERVE (1st Part)

General Equation = $-0.152637 + 2.40454X_t + 1.38057X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.998	1682.61	2.11	0.581 1.09	15.9 -8.96	.000396	.388 / .944
FY 74	.654	10.54	1.70	3.06 6.16	-1.85 2.46	.0272	.388 / .978
FY 75	.947	99.8	2.04	1.44 2.84	2.74 -0.386	.00263	.388 / .957
FY 76	.978	249.78	2.03	0.863 1.66	6.38 -2.79	.000658	.388 / .976
FY 77	.973	198.62	2.02	0.810 1.66	4.68 -1.23	.00171	.388 / .901
FY 78	.968	122.68	1.42	0.826 2.89	1.97 1.51	.00154	.250 / .562
General Model	.900	254.04	2.00	0.605 1.34	3.96 1.03	.00516	.388 / .976

TABLE XLI

3740B OPERATIONS AND MAINTENANCE, AIR FORCE RESERVE (2nd Part)

General Equation = $0.965958 + 0.0417092X_t$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.294	10.18	.569	.01398	3.19	.000152
FY 74	.274	8.94	.773	.00409	2.99	.000011
FY 75	.655	42.89	.385	.00791	6.55	.000048
FY 76	.506	20.47	.425	.00605	4.52	.000018
FY 77	.258	3.43	1.43	.149	1.85	.000725
FY 78						
General Model	.294	40.26	.987	.00657	6.34	.000135

TABLE XLII

3830A AIR NATIONAL GUARD, MILITARY CONSTRUCTION

General Equation = $-0.0378045 + 1.21366X_t - 0.184784X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.993	726.49	1.84	0.129 0.109	10.39 -3.01	.000494	1.00 / 1.00
FY 74	.993	628.86	1.78	0.171 0.139	7.26 -1.59	.000254	1.00 / 1.00
FY 75	.998	2400.36	2.42	0.102 0.0702	19.16 -9.07	.000313	1.00 / 1.00
FY 76	.997	1668.16	1.99	0.114 0.0881	14.15 -4.81	.000165	1.00 / 1.00
FY 77	.999	5363.87	2.28	0.0454 0.0375	18.95 0.978	.000045	1.00 / 1.00
FY 78	.998	2358.49	2.17	0.0640 0.0749	18.29 -3.21	.000083	.750 / .747
General Model	.988	2822.54	1.99	0.0592 0.0528	20.49 -3.49	.000786	1.00 / 1.00

TABLE XLIII

3840A OPERATIONS AND MAINTENEANCE, AIR NATIONAL GUARD (1st Part)

General Equation = $-0.031264 + 2.39595X_t + 1.36596X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.999	12437.8	1.57	0.101 / 0.244	24.07 / 5.46	.000016	.333 / .915
FY 74	.998	2379.8	1.81	0.282 / 0.63	7.38 / 3.48	.000055	.333 / .913
FY 75	.998	3172.41	1.75	0.246 / 0.583	9.59 / 2.68	.000030	.333 / .915
FY 76	.999	7323.27	1.60	0.100 / 0.285	24.59 / 3.17	.000064	.333 / .929
FY 77	.998	2157.21	1.75	0.301 / 0.668	8.93 / 1.33	.000058	.333 / .938
FY 78	.999	2673.02	2.25	0.181 / 0.637	11.95 / 4.28	.000074	.250 / .688
General Model	.989	3157.44	1.92	0.162 / 0.423	14.78 / 3.23	.000223	.333 / .938

TABLE XLIV

3840A OPERATIONS AND MAINTENANCE, AIR NATIONAL GUARD (2nd Part)

General Equation = $0.90332 + 0.272179X_t - 0.181265X_t2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.759	34.16	1.67	0.0214 0.0139	4.20 -3.45	.000000
FY 74	.671	24.49	2.58	0.0286 0.0203	4.19 -3.48	.000003
FY 75	.509	12.43	2.16	0.0304 0.0209	3.43 -2.99	.000002
FY 76	-.076	.3617	2.36	0.0219 0.0146	0.368 -.299	.000000
FY 77	.885	31.66	2.55	0.279 0.291	3.60 -3.12	.000005
FY 78						
General Model	.175	11.95	2.09	0.06725 0.04961	4.046 -3.654	.000060

TABLE XLV

3840B OPERATIONS AND MAINTENANCE, AIR NATIONAL GUARD (1st Part)

General Equation = $-0.111061 + 1.57768X_t + 2.80038X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.982	353.66	1.67	0.463 1.08	4.81 1.39	.00202	.389 / .970
FY 74	.985	429.77	2.08	0.411 0.959	3.92 2.93	.00159	.389 / .956
FY 75	.903	47.43	2.06	2.23 4.06	2.94 -1.60	.00224	.389 / .812
FY 76	.963	158.30	2.06	0.802 1.71	2.72 0.784	.00208	.389 / .872
FY 77	.983	368.41	2.03	0.396 0.926	1.96 4.37	.00149	.389 / .896
FY 78	.973	147.43	2.16	0.615 2.16	-.568 4.35	.000856	.250 / .46.2
General Model	.929	497.14	2.00	0.389 0.886	4.05 3.10	.00276	.389 / .970

TABLE XLVI

3840B OPERATIONS AND MAINTENANCE, AIR NATIONAL GUARD (2nd Part)

General Equation = $0.924924 + 0.0916035X_t$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.181	5.86	.755	0.00649	2.42	.000032
FY 74	.489	22.13	.745	0.00799	4.70	.000049
FY 75	.106	3.60	1.11	0.0414	1.89	.00134
FY 76	.631	33.5	.529	0.0404	5.79	.000838
FY 77	.789	23.5	1.45	0.148	4.85	.000476
FY 78						
General Model	.237	30.8	1.38	0.0165	5.55	.000872

TABLE XLVII

3850A AIR NATIONAL GUARD PERSONNEL, AIR FORCE

General Equation = $-0.0255513 + 2.71992X_t + 0.290805X_t2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.999	6950.94	1.92	0.119 0.275	20.64 2.37	.000042	.361 / .979
FY 74	.998	2273.99	1.74	0.261 0.542	8.32 2.58	.000060	.361 / .997
FY 75	.999	5251.76	1.69	0.139 0.324	19.04 1.18	.000069	.361 / .992
FY 76	.999	4695.69	1.88	0.147 0.339	19.32 -.203	.000072	.361 / .990
FY 77	.998	3694.61	1.72	0.144 0.359	17.35 2.52	.000154	.361 / .950
FY 78	.999	3193.76	2.27	0.244 0.774	8.29 3.94	.000071	.250 / .691
General Model	.994	6037.29	1.95	0.115 0.281	23.75 1.04	.000314	.361 / .997

TABLE XLVIII

3850A AIR NATIONAL GUARD PERSONNEL, AIR FORCE (2nd Part)

General Equation = $0.978694 + 0.0248566X_t$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.820	106.07	.362	0.0029	10.29	.000007
FY 74	.682	50.44	.595	0.00064	7.10	.000000
FY 75	.339	12.79	.552	0.00142	3.58	.000001
FY 76	.401	14.39	.556	0.00213	3.79	.000002
FY 77	.619	13.99	.818	0.00901	3.74	.000003
FY 78						
General Model	.226	30.48	1.96	0.0045	5.52	.000074

TABLE XLIX

3850B AIR NATIONAL GUARD PERSONNEL, AIR FORCE (1st Part)

General Equation = $-0.654782 + 2.89909X_t - 0.906074X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.993	675.14	2.15	0.382 0.795	2.69 3.26	.000883	.389 / .818
FY 74	.932	69.39	1.55	1.64 2.75	3.15 -1.64	.000286	.389 / .999
FY 75	.989	443.79	1.99	0.454 1.11	8.04 -2.42	.000445	.333 / .965
FY 76	.984	318.17	1.81	0.581 1.17	1.88 2.08	.000209	.361 / .983
FY 77	.989	427.86	1.94	0.712 1.62	-0.825 5.50	.000497	.333 / .952
FY 78	.981	407.29	1.66	0.153	20.18	.00109	.250 / .771
General Model	.889	281.84	2.00	0.459	6.32	.00897	.389 / .999

TABLE L

3850B AIR NATIONAL GUARD PERSONNEL, AIR FORCE (2nd Part)

General Equation = $0.97848 + 0.027353X_t$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared
FY 73	.653	34.84	.334	.000333	5.90	.000000
FY 74	.309	10.82	.937	.00219	-3.29	.000003
FY 75	.379	15.67	.514	.00602	3.96	.000036
FY 76	.353	11.93	.776	.00385	3.45	.000008
FY 77	.379	6.50	0.914	.0474	2.54	.00014
FY 78						
General Model	.063	7.67	1.89	.00988	2.77	.00347

TABLE LI

4921A AIR FORCE STOCK FUND, APPORTIONED

General Equation = $-0.0195798 + 0.826156X_t + 0.250137X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73							
FY 74							
FY 75							
FY 76							
FY 77							
FY 78							
General Model	.998	14265.81	2.01	0.0349 0.0283	23.68 8.84	.000002	1.00 / 1.000

TABLE LII

4921B AIR FORCE STOCK FUND, APPORTIONED

General Equation = $0.00617084 + 0.803902X_t + 0.245044X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73							
FY 74							
FY 75							
FY 76							
FY 77							
FY 78							
General Model	.997	12958.88	2.02	0.0370 0.0292	21.72 8.40	.000001	1.00 / 1.00

TABLE LIII

4921A AIR FORCE STOCK FUND, EXEMPT

General Equation = $-0.100691 + 0.982446X_t + 0.173366X_t2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73							
FY 74							
FY 75							
FY 76							
FY 77							
FY 78							
General Model	.989	3017.20	2.01	0.0919 0.0672	10.68 2.58	.000003	1.00 / 1.00

TABLE LIV

4921B AIR FORCE STOCK FUND, EXEMPT

General Equation = $-0.0978857 + 0.988841X_t + 0.163904X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73							
FY 74							
FY 75							
FY 76							
FY 77							
FY 78							
General Model	.993	4525.55	1.98	0.0751 0.0547	13.16 2.99	.000002	1.00 / 1.00

TABLE LV

4922A AIR FORCE INDUSTRIAL FUND

General Equation = $-0.00306748 + 0.957288X_t + 0.041634X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.999	47635.04	1.58	.00459	218.25	.000021	1.0 / 1.00
FY 74	.999	6181.09	2.12	.0575 .0435	14.13 3.63	.000026	1.0 / 1.00
FY 75	.999	6727.4	1.82	.0542 .0414	16.90 1.78	.000026	1.0 / 1.00
FY 76	.999	69261.9	1.38	.0038	263.18	.000014	1.0 / 1.00
FY 77	.999	9902.18	1.53	.0451 .0340	20.49 1.93	.000015	1.0 / 1.00
FY 78	.999	11331.49	1.46	.00947	106.45	.000087	.750 / .746
General Model	.999	31758.07	1.98	.0175 .0156	54.75 2.67	.000066	1.0 / 1.00

TABLE LVI

4922B AIR FORCE INDUSTRIAL FUND

General Equation = $0.0125830 + 0.877433X_t + 0.158903X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73							
FY 74							
FY 75							
FY 76							
FY 77							
FY 78							
General Model	.998	15562.43	1.97	0.0307 0.0255	28.54 6.22	.000003	1.0 / 1.00

TABLE LVII

5095A WILDLIFE CONSERVATION

General Equation = $0.0159214 + 0.923311X_t + 0.0596252X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.963	106.07	2.18	0.579 0.379	3.38 -1.61	.000357	1.0 / 1.00
FY 74	.996	3035.85	1.95	0.0175	55.09	.000304	1.0 / 1.00
FY 75	.997	3307.47	1.91	.0175	57.50	.000303	1.0 / 1.00
FY 76	.994	1971.93	.729	0.0215	44.41	.000457	1.0 / 1.00
FY 77	.993	1475.97	1.69	0.0251	39.69	.000627	1.0 / 1.00
FY 78	.989	727.66	2.13	0.0386	26.98	.00062	.750 / .724
General Model	.996	1233.15	2.06	0.0348 0.0314	26.51 1.90	.000709	1.00 / 1.00

TABLE LVIII

8418A AIR FORCE CADET FUND

General Equation = $0.024674 + 0.882997X_t + 0.0732549Xt2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.992	642.74	1.87	0.13 0.109	5.12 1.96	.000546	1.00 / 1.00
FY 74	.995	991.00	1.92	0.115 0.0955	6.86 1.79	.000333	1.00 / 1.00
FY 75	.999	3779.95	1.95	0.054 0.0458	15.54 1.63	.000097	1.00 / 1.00
FY 76	.997	1763.03	2.04	0.0828 0.0675	8.83 2.48	.000126	1.00 / 1.00
FY 77	.996	1134.67	1.83	0.109 0.091	7.36 1.86	.000281	1.00 / 1.00
FY 78	.996	2087.67	2.21	0.0207	45.69	.000179	.750 / .698
General Model	.980	1627.44	2.00	0.0753 0.0656	11.73 1.12	.000509	1.00 / 1.00

TABLE LIX

8418B AIR FORCE CADET FUND

General Equation = $0.0153156 + 0.943789X_t + 0.0133688X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.998	2022.08	1.89	0.072 0.0613	10.44 2.20	.000191	1.00 / 1.00
FY 74	.998	3325.59	1.73	0.0489 0.0439	15.86 2.86	.000124	1.00 / 1.00
FY 75	.997	1357.97	1.69	0.129 0.0956	5.22 2.05	.000123	1.00 / 1.00
FY 76	.995	932.87	1.73	0.131 0.102	4.28 2.83	.000218	1.00 / 1.00
FY 77	.999	7384.52	2.39	0.0419 0.0389	18.55 5.39	.000057	.916 / .899
FY 78	.998	1851.94	2.36	0.073 0.0855	11.31 2.18	.000109	.750 / .734
General Model	.984	1940.19	1.93	0.0676 0.0593	13.97 0.225	.000326	1.00 / 1.00

TABLE LX

8420A Surcharge Collection, Sales of Comm-Stores, Air Force

General Equation =

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.985	256.25	2.09	.392 .256	.401 2.39	.000152	1.0 / 1.00
FY 74	.993	562.48	2.07	.196 .167	9.27 -2.71	.00136	1.0 / 1.00
FY 75	.999	4286.29	1.73	.0622 .0495	16.15 1.00	.00005	1.0 / 1.00
FY 76	.995	1155.36	2.36	.0883 .0794	6.39 4.68	.00041	1.0 / 1.00
FY 77	.998	2802.37	1.97	.0713 .0588	16.84 -2.53	.00011	1.0 / 1.00
FY 78	.993	576.81	2.02	.147 .171	3.94 3.67	.00044	.75 / .781
General Model	.989	2860.55	1.99	.063 .0561	15.42 1.52	.00187	1.0 / 1.00

TABLE LXI

8420B Surchrg coll., Sales of Comm-Stores, AF

General Equation = $.00130201 + .923375X_t + .0745478X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.999	217152.43	2.16	.00755 .00654	116.67 16.42	.000003	1.0 / 1.00
FY 74	.999	204591.66	2.5	.00767 .00673	123.21 7.62	.000004	1.0 / 1.00
FY 75	.999	179718.19	2.06	.00237	423.90	.000006	1.0 / 1.00
FY 76	.999	5346.11	1.88	.0659 .0489	9.59 6.61	.000026	1.0 / 1.00
FY 77	.999	108224.54	2.08	.00306	328.98	.00001	1.0 / 1.00
FY 78	.999	17182.84	1.52	.00769	131.08	.00002	.75 / .751
General Model	.999	38130.84	2.05	.0163 .0145	56.82 5.14	.00017	1.0 / 1.00

TABLE LXII

8928A Air Force General Gift Fund

General Equation = $.215902 + 1.23331X_t - .570819X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	.767	17.48	2.06	1.24 1.04	3.82 -2.86	.0451	1.0 / 1.00
FY 74	.934	64.33	2.05	.0487 .0456	7.51 -5.69	.00009	.917/ 1.00
FY 75	.891	91.35	1.68	.106	9.56	.0112	1.0 / 1.00
FY 76	.905	43.87	2.29	.0769 .0602	2.97 -1.46	.00008	1.0 / 1.00
FY 77	.729	11.80	1.66	.226 .153	.921 -.301	.00009	1.0 / 1.00
FY 78	.860	22.56	1.62	1.24 1.38	4.53 -3.53	.0241	.75 / .993
General Model	.0996	4.54	1.96	.992 .819	1.34 -.687	.122	1.0 / 1.00

TABLE LXIII

9003A Federal Interfund, Air Force

General Equation = $-1.79235 + 13.8515X_t - 9.45402X_t^2$

	Adj. R Squared	F-Test Statistic	Durbin-Watson Statistic	Standard Error	Student T Ratio	Sigma Squared	Inflection Point %-Time/%-$
FY 73	-.0593	.496	1.97	1.36	.704	1.18	.917 / 1.00
FY 74	.663	11.82	1.98	.359	-1.78	.00670	1.0 / 1.00
FY 75	.334	3.26	1.85	.892 .779	.993 -.479	.0988	.917 / 1.00
FY 76	.185	2.02	1.90	115.13 86.87	1.99 -1.93	101.86	1.0 / 1.00
FY 77	.911	47.28	1.92	.761 .674	2.36 -.555	.00872	.917 / 1.00
FY 78	.510	9.34	2.22	1.41	-3.06	.828	.75 / .944
General Model	.0232	1.73	2.00	10.69 9.81	1.29 -.964	30.11	1.0 / 1.00

TABLE LXIV